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W A S H I N G T O N, D.C.

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A N
ESSAY
ON THE
Malignant Pestilential Fever
INTRODUCED INTO
THE WEST INDIAN ISLANDS
FROM BOULLAM,
ON THE COAST OF GUINEA,

As it appeared in 1793 and 1794.

—
BY C. CHISHOLM, M. D.

AND SURGEON TO HIS MAJESTY'S ORDNANCE IN GRENADA.

TO WHICH IS ANNEXED,
A DESCRIPTION
OF THE

American Yellow Fever,

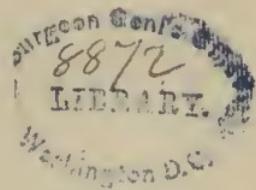
WHICH PREVAILED AT CHARLESTON IN 1748,

In a Letter from DR. JOHN LINING.

PHILADELPHIA:

PRINTED FOR THOMAS DOBSON, AT THE STONE HOUSE,
N^o 41, SOUTH SECOND STREET.

1799.



TO THE
MEDICAL GENTLEMEN
OF
HIS MAJESTY'S NAVY AND ARMY.

GENTLEMEN,

THE uncommon mortality which marked the Epidemic, which is the subject of the following Essay, among his Majesty's sea and land forces in the West Indies, during the last eighteen months; and the total inefficacy which the usual remedies, in similar circumstances, were found to possess; will, it is presumed, render any attempt to throw light

light on the causes, nature, and appropriate treatment of so dreadful a malady, at least not unacceptable to the Public.

You, Gentlemen, are more particularly interested ; as in the course of your service you may be led into situations, wherein the feelings of humanity, and the duties of your profession, will have urgent demands on you to exert your abilities ; but, in which it may happen, from the want of a guide, in circumstances almost altogether new, that the latter may avail you little in alleviating the misery of the sufferers intrusted to your care. To no body of men can I therefore, with more propriety,

offer

offer the observations contained in the following sheets, than the very respectable one which the Medical Gentlemen of the British Navy and Army constitute. If they should prove advantageous, by your adopting the means recommended, my utmost wish will be gratified; and that they may, in your hands, the very extensive experience which my situation gave rise to, leaves me no room to doubt.

Unknown as I am to the greatest part of you, Gentlemen, addressing you in this manner, may be considered as a presumption totally unwarrantable. Conscious, however, of the uprightness of my intentions,

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I hazard the attempt. And, permit me to add, that I feel less reluctance in doing so, as no motive of private interest, no wish to introduce myself to public notice, influence me; feeling myself as indifferent, with respect to pecuniary considerations, as anxious to contribute my mite to the public good.

I am,

GENTLEMEN,

With the greatest respect and esteem,

Your most obedient

and very humble servant,

C. CHISHOLM.

LONDON,
OCT. 22, 1794.

P R E F A C E.

A N anxious wish to see the subject of the following sheets treated by an abler pen, has hitherto prevented the Author from offering the Public this feeble effort to promote their welfare. Finding, however, that nothing adequate to its importance has appeared; and being conscious of the possession of perhaps more extensive experience in the

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Malignant Pestilential Fever, than has fallen to the lot of almost any practitioner in this country, he thinks it would be acting contrary to the principles of humanity, as well as the interest of the medical profession, should he delay any longer a publication, which indeed claims no other merit than truth with respect to the statement of facts, and novelty with respect to the mode of treatment found successful.

That the Malignant Pestilential Fever is no rare occurrence in cold climates, has been too fatally experienced.

rienced. It is not so, however, in hot climates, if we may judge from the writings of medical practitioners; for although symptoms of malignancy have appeared in the Yellow Fever of the country, in its advanced stage, seldom have those of pestilence shewn themselves; and never has contagion till now, rendered the usual precautions observed in Europe against the introduction of the Plague, necessary.

Perhaps the following consideration may constitute a further apology for the Author's intruding himself on the Public: It is evident that

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the most respectable writers on the Malignant Fever have found infinite difficulty in ascertaining an appropriate mode of cure: what but this are we to infer from the following passages: “ I have observed before, that a delirium would arise from two opposite errors; one from large and repeated bleedings; and the other from wine and the cordial medicines being taken too early. It appears therefore how nice the principles are that regard the cure: thus, neither a hot nor a cool regimen will answer with every patient, nor in every state of the disease.”—“ Yet

were

were putrefaction the only change made in the body by contagion, it might be easy to cure such fevers by the use of acids only, or other antiseptics. But as the disease, when once formed, is not to be removed by such means alone, it would therefore seem as if some parts of the brain, or nervous system, were early inflamed, and the fever kept up by that inflammation ; as if to this circumstance most of the symptoms were owing ; and, as if in the advanced state, a cure could not be obtained until the obstructing matter was resolved by suppuration or putrefaction."

faction."¹ Nothing can more remarkably betray the uncertainty of this eminent physician with respect to the true nature of Pestilential Fevers; nor can any thing more directly point out the desideratum in their cure. The Author has not the presumption to imagine that the happy medium, so much wanted, has been discovered by him; but he has reason to believe, that the candid and unprejudiced practitioner may find in the following little Essay, some observations

¹ Sir John Pringle's Observations on the Diseases of the Army, 7th ed. p. 316 and 337.

vations which may throw light on this very obscure subject. It may at least excite the observing and ingenious to attend more to the peculiar nature of pestilential inflammation ; to the exhalation of serous fluid in the cavities of the brain, and the consequent compression of that organ ; and to the means which resolve the former without inducing a dangerous state of debility, and promote the absorption of the latter in fevers of a subsequent nature. No doubt the means here recommended will appear bold, and perhaps empirical to an European physician ; but

let

let prejudice be set aside, and let facts only be attended to, and sure he is, a candid practitioner will find sufficient encouragement to adopt them. What has been advanced, powerfully militates against theory; but how seldom are the dogmata of theorists found free of fallacy in practice!

Upon the whole: all the Author aims at, is to relate in a plain and unadorned style, the result of his own experience in one of the most dangerous and insidious diseases the human frame is subject to, with the sole

sole view of contributing his mite to the public good: if he succeeds, he will receive the highest possible gratification. With the celebrated Dr. Lind, he may say, “these observations claim the more attention, as not being *only* a few remarks made in private, or on any *one* particular fever, which might prove an exception to a general established principle in practice: They are the result of an attention to some *hundred* patients, whose cases are still preserved.”²

In

² Dissertation on Fevers and Infection, ch. II.
sect. I.

In excuse for the many inaccuracies of style, and for whatever other errors he may have committed in the Introduction, and in the Essay itself; all he has to plead is, his having written both on the spot, where he could not avail himself of much assistance, either from men or books.

GRENADA,
JUNE 1, 1794.

INTRODUCTION.

BEFORE I enter on the History of the Malignant Pestilential Fever, which so generally prevailed in this and the neighbouring islands, I think it may not be improper to give some account of Grenada, as far as relates to the face of the country, its productions, its diseases, and the state of the weather. On settling in this island, I was convinced that a knowledge of the climate, and of the various changes which take place in the weather throughout the year, would be highly conducive to success in the practice of Medicine ; and I was the more strongly inclined to observe and record these, by finding that nothing of the kind had been hitherto done. For this purpose I immediately began a diary or journal of the weather ; and have ever since continued it, with few interruptions ; but, as a journal of the whole period would be tedi-

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ous and unnecessary, I have given only that of the three first years; and to illustrate my Observations on the Malignant Pestilential Fever, I have added the journal of the weather for the year 1793. Dr. Hillary is the only medical writer I am acquainted with, who has given the public any account of the weather of these islands; but, although his very able account may be very useful to practitioners in Barbadoes, and other islands whose surface is comparatively level, and whose hills rise only to a trifling height, and in no instance exhibit the wild and picturesque scenes of Grenada, St. Vincent, Dominica, and a few others, it is not so here: and the reason is evident. The windings of the innumerable hills in Grenada produce a change of temperature at the end of every hundred yards; under their shelter the heat is often almost unsupportable, and the body is bathed in the most profuse sweat: beyond this, turning an angle, and being suddenly exposed to the prevailing winds, which there blow with violence, proportioned to the narrow vallies which confine them, the body is in an instant dried up: an aguish sensation takes place, and not unfrequently

frequently topical pains and inflammations of a most dangerous nature, are instantaneously produced. It is from this cause, as much as from any other that hepatic and pulmonary inflammations are more frequent, and more violent in these rugged mountainous islands than in Barbadoes, Antigua, and others of a smoother and less divided surface: and this is the principal cause also that topical inflammations, particularly those of the liver, are met with at all seasons, during the hot and rainy as well as the cool and dry: a circumstance otherwise inexplicable. It also accounts for the efficacy, as a preventative of any medium between the shirt and skin, which may absorb the perspired fluid, whilst it keeps up an equal temperature on the surface, whatever changes take place in the surrounding atmosphere. Thus, a flannel-shirt, however strange it may seem to an European not acquainted with the circumstance above mentioned, is the best preservative of health in this island, and perhaps throughout the torrid zone.

The atmosphere of Grenada differs widely from that of the low islands, Barbadoes, Antigua,

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tigua, &c. The innumerable points and ridges of the two mountains, which run nearly north and south, and separate the windward from the leeward districts, arrest or attract the passing clouds. These, either falling in rain, or giving rise to springs, whilst they fertilize the soil, fill the atmosphere with watery particles. This moist state of the atmosphere exists throughout the whole year; but is greater in proportion to the quantity and density of the clouds. In the rainy season torrents of water rush down the craggy sides of the higher regions of these mountains; and the rivulets, often overflowing their banks by this addition, inundate the country below. In the dry season, a considerable degree of moisture is always perceptible; but then it falls during the night in the form of dew; and the streams and rivulets, though plentifully supplied, run in their natural channels with a placid current, except where their course is interrupted by precipitous rocks or large stones. The atmosphere of the low islands, on the contrary, is generally remarkably dry; nor are they blessed with the streams and rivers which beautify and benefit Grenada. Hence the temperature in situations even not subject

ject to alternate cold and heat, is very irregular; and from this also it is seldom possible to work an electrical machine with advantage, the fluid collected continually flying off, attracted by the surrounding moisture. From this cause too the island, seen from sea, is for ever obscured with clouds; the summits of the mountains are almost never distinguishable; and even hills nearer the coast, on account of the density of the medium through which they are viewed, seldom exhibit their true shape, height, and colours. The low islands are never thus enveloped in mist, never thus seem “ever-threat’ning storms;” their atmosphere being less loaded, becomes a purer medium, and seldom lets fall the deluges experienced here. From these considerations, the following Journal may have its use.

Grenada is one of the most southern of the Caribbean islands: a situation which exempts it from the dreadful hurricanes which frequently lay waste those farther northward. It is composed of two immense mounitains, which terminate in peaks; but, being united a little below their summits
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by a gradual slope, the division is not at first very perceptible. On the windward, or north-east side, the descent is infinitely more gradual than on the leeward or south-west side; nor is it there encumbered with the multitude of conical hills, and rocks of various form and magnitude, which characterise the latter. So gradual is the rise of the country in the district of Marquis and part of Seauteur, as to give the idea of an extensive plain, most beautifully diversified by gentle slopes, rivers, delightful vales, thickets and extensive cane-fields, and terminated by wooded mountains, whose pointed tops are often hid in clouds. The leeward side, on the contrary, is mountainous to the very sea; and the whole is thrown together in the wildest and most picturesque manner. Magnitude and boldness of design are the prevailing features. In general, excepting a part of the windward side of the island, by supposing innumerable and distinct acclivities of conical or angular figures, increasing in bulk as they are removed from the sea, crowding on each other, and at length terminating in two enormous piles, whose crags and ridges flagged with wood,

and

and whose cliffs, often seen towering above the floating clouds in august and gigantic forms, exhibit a most stupendous background,—we shall be able to conceive a tolerably just idea of the grand outlines of the very singular scenery of this romantic country. On more attentively viewing the picture, we find hills precipitous, acclivous, or winding circularly in sharp inaccessible ridges, so as to form frightful gullies, torn by torrents in the rainy season, or deep, dark glens and bounded hollows, seldom trod by human foot; where streams, brawling over pebbly beds, or often interrupted in their course, and falling over the surface of a rocky scarp, and collected in stony basons underneath, form shady cool retreats; in which alone

“——Planxère forores
Naiades —————
Planxère et Dryades, Plangentibus affonat Echo.”

OVID.

All round is a “ woody theatre, of stateliest view,” and shrubbery and flowering herbs of uncommon variety, beauty, and flavour. In many places the scene is enlivened by cascades,

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cascades, sometimes fifty feet in height ; but no living creature, except the wood-pigeon, a few small birds, the dappled agootee, and the armadilloe, inhabit these wilds. Where cultivation ends, little scattered spots are seen diversifying this wilderness of wood, on which the industrious hands of poor settlers, chiefly French, have formed small plantations of coffee, intermixed with plantains, and sheltered from the rude shock of the prevailing north-east wind, by hedges of the ever green calaba¹, whose deep shade affords an interesting variegation from the surrounding paler green. Alternating with these are seen neat but small patches, producing all the kitchen can require in the vegetable kingdom ; which, continual moisture and coolness contributing to their production, are ever plentifully raised. Beyond this, cultivation takes a larger sweep, and often with coffee, cacao, cotton, are seen fields of sugar-cane, planted and flourishing on the steep sides of hills, or in narrow winding vallies, frequently chequered by insulated cones, or tufted craggs of grotesque figures ;

¹ *Calophyllum Calaba*, Linnæi.

figures; or overhanging cliffs matted o'er with curious grassy plants², ferns, or moss; or bare argillaceous rocks, disposed in inclining or horizontal strata; or volcanic masses, distinct, loose, and black; or extended terraces of soil, in culture or in wood, supported by majestic columns of the basaltic kind. Here too are seen the stately mountain-cabbage, and the wide-spreading silk cotton-trees, towering above all others, in majestic pre-eminence: rivers are seen winding through every valley, and here and there natural pastures are left, on which the cattle and stock of neighbouring plantations are seen feeding. Farther on, and even to the sea, where the surface admits of cultivation, the whole is covered with the sugar-cane, regularly planted in oblong fields, separated by hedges of

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² *Pitcarnia latifolia* et *angustifolia*, a new genus of the *Hexandria Mognynia* Linnæi. It covers the steepest rocks in a very singular manner, resembling at a distance some species of grass; the leaves lap over each other, and form a thick mat, by which precipices, on which no other plant grows, are completely covered. From amidst these, beautiful ramous clusters of coral-coloured flowers project.

My authority for the name, is my worthy friend Mr. Anderson, Botanist at St. Vincent.

the lime, the logwood, the Angola-pea, the false acacia, the prickly pear, physic-nut, &c. These are frequently diversified by irregular groupes of negroe-huts, surrounded by and intermixed with groves of the banana, and arbours of the grenadilla, water-lemon, and various viminal plants of the pea kind. Adjoining these romantic groupes, are seen the dwelling-houses, and the works, as they are called, or the buildings erected for the manufacture of the cane-juice into sugar ; to which not unfrequently are attached orchards containing a great variety of indigenous and exotic fruit-trees. In detached corners also are seen the gardens or provision-grounds of the negroes, planted according to the whim or taste of the temporary owner ; and here and there the tops of conical hills, too steep or too barren for culture, crowned with tufts of natural wood, become interesting objects, from the variety of tints they introduce.

The coast in many places terminates abruptly in rocky precipices, the face of which is often curiously perforated into caverns, arches, &c. by the continual dashing of the

the sea against it. The tops of these precipices are sometimes fertile, but more generally either a bare soft rock, probably a volcanic production, called by the inhabitants, Tuf, or producing a curious species of cyperus, intermixed with trees of the erect prickly pear, or the Abyssinian koll-quall of Mr. Bruce. In other places, it runs out into long narrow points, frequently ending in high cliffs of tuf, but more frequently in curious rocks or congeries of the Madri pore coralline, the cells of which nearest the sea, and occasionally overflowed by it, are inhabited by zoophytes, lithophytes, and animals of the Mollusca-tribe. These points are seldom covered with much soil, but generally serve well for sheep and goat pastures. They form small but convenient and deep bays, particularly on the south-east coast. Some of these bays insinuate themselves so far into the country, as, when seen in certain points of view, to have all the ornamental effect of winding lakes: and at Calivini, Bacaye, and a few other places, they have the additional beauty of fine sloping woods, intermixed with lawns of the brightest green, and a back ground of

pictur-

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picturesque scenes in the interior country. Sometimes, however, the coast trends circularly for several miles; low, sandy, without a single inlet, and protected from the encroachments of the ocean, which beats against it with all the additional force of the easterly or trade-wind, by a prodigious barrier of corallines. Rivers being here frequently shut up by mounds of loose sand thrown up in their mouths by the violence of the surf, much stagnant water and marshy tracts are found, at all times corrupting the air to leeward of them for several miles; these districts therefore, although incomparably the richest, and in many respects the most beautiful, are the most inimical to health of any of the island.

All along the coast, a prodigious variety of corallines, of every form, stretch from the north-east round easterly to the south-west: the bottom almost everywhere in that direction is formed of them, at least a league in breadth; and in some places, particularly off the south-east, extensive submarine groves, of a most beautiful muricated madripose, are seen, chiefly of a bright pink-colour.

colour. These coralline-beds and groves are frequently extremely dangerous to shipping. They are often fished up for the purpose of making lime, which they answer tolerably well in temporary buildings; but the lime manufactured from them, possesses by no means the strength of the stone-lime. The transparency of the water over these corallines is so remarkably great, that the bottom can be distinctly seen at the depth of ten and fifteen fathoms; and on taking a view of the coast from any considerable adjoining height, the whitish or light green colour of the sea, clearly points out the limits of these curious productions. Every where on their surface vast quantities of echini and asterias are found; the former troublesome and even dangerous, by their long and strong prickles, or spines. They constitute also the secure abode, except in stormy weather, of innumerable crabs, sea cray-fish and univalve shell-fish: of the last of which there is a great and beautiful variety. Many species of the sponge, particularly the flabelliform, the festularis, the aculeata, and the nodosa, also, lodge on these lithophytic-beds. Vast numbers of excellent small fish are always found

found within the limits of the corallines, particularly where marine vegetables abound; but the larger kinds resort to the sand-banks a few leagues to leeward of the island, or are caught in deep water, where no corallines are found.

From the south-west to the north-east, along the western shore, no corallines are ever seen, the coast being amazingly bold and precipitous; and the shore where the bottom is shelving being covered with stones of the quartzose and florl kinds, quadrangular, prismatic, or oval, and of a bluish grey colour; either thrown up by the sea, or the produce of its encroachment on the adjoining high rocky cliffs. These, on this part of the coast, are often overhanging in an awful and tremendous manner, and (the road running underneath) have been not unfrequently fatal to passengers, particularly after very stormy weather; during which, the sea beating with dreadful violence against their lower strata, has shaken the whole mass, and loosened and disjoined large fragments. Together with these are

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frequently found some beautiful species of the pyrites, chiefly of a yellow and dark blue.³

Along the edges of bays, seldom ruffled by boisterous winds, or the pieces of sea-water, called Lagoons, whose situation screens them from the undulation of bays, the action of the tides, or the agitation of winds, a curious species of actinia, adhering to stones and corallines, is found ; and that singular insect of the mollusca kind, called by Linnæus, *Holothuria Priapus*.

This species of holothuria, which, till of late, was almost unknown, inhabits a membranaceous

³ On two parts of this coast, the most regular basaltes I ever saw, form two points, exactly resembling at a distance the huge fluted columns of Gothic Churches. Some of these are perpendicular, some are inclining ; and where the points terminate, masses composed of the broken ends of basaltic columns, run shelving a considerable way into the sea. These are most perfect between Black Bay and Grand Roy, where the inhabitants call them the “organs ;” and though not so extensive as the singular basaltes of Staffa, as represented by the celebrated Sir Joseph Banks, are evidently similar in every respect.

branaceous semi-transparent sheath, perhaps of its own construction, always contained in a tubular hole in rocks, two or three feet under the surface of the water. From this it pushes out and expands its tentacula in quest of food; but draws all in on the slightest appearance of danger; so that it is extremely difficult to procure one uninjured. The tentacula of this species, when spread out by the animal, form a seeming flower, exactly resembling the larger passiflora, or granadilla. The length of the body, which has much the appearance of that of the larger scolopendra, is about five or six inches, and marked with innumerable annular ridges, which near the mouth, or tentacula, are more distinct and prominent.— These annuli terminate on each side in very minute claws or feet, which serve the animal in creeping out of its sheath, to a limited length, in quest of food. The tentacula are of a most singular structure, and variegated with a number of beautiful colours, the most conspicuous of which are purple and yellow. Each tentaculum is about two or three inches in length, and plumose, or formed in the manner of the plumæ or laminæ

laminæ, of feathers, the beards of which are endowed with exquisite feeling, for on the slightest undulation of the water, or striking gently the vessel containing it, they are instantly erected, and exhibit a singular and most beautiful assemblage of colours. If the undulation of the water is increased, or if any of the tentacula are slightly touched, the animal instantly, and with astonishing quickness, withdraws into its sheath or habitation, and nothing is apparently seen but a piece of ill-looking membranaceous seaweed.

The soil of Grenada may be divided into four kinds: 1st. A black rich mould, found chiefly in low vallies, and on the gentle slopes of the more rounded hills. 2d. A mixture of light sand and black mould, generally found near the sea, and containing a large portion of sea-salt. 3d. A mixture of black mould, sand, and a metallic earth, of a reddish colour, found in the steeper parts of what may be called the second region of the island, or where cultivation is extended with difficulty. 4th. A red earth, or ochre, frequently intermixed with black shining metal-

metallic particles, sterile, and incapable of culture with even the aid of the strongest manure. This is generally found in the higher parts of the mountainous country, sometimes covered with wood and a coarse long grass; but oftener naked, and producing a fine effect contrasted with the surrounding green. The depth of these varies very much: in some places it is only a few inches; in others, particularly in deep valleys, several feet, and evidently there, the accumulation of the washings from the adjoining hills in the rainy season: in other places, particularly where the soft rocky substance, called Tuf, prevails (probably the tuffa⁴ of the Italians) the depth of the soil is not more than half an inch; and to be found only in chinks and fissures. In many places, where the eye can trace no vestige

⁴ In Sir William Hamilton's account of the earthquakes which happened in Calabria, from February to May 1783, letter of the 23d of May, mention is made of this volcanic substance. "I pushed on to the town of Pezzo, in Calabria Ultra, where I landed on the evening of the 6th of May. This town situated on the sea, and on a volcanic tuffa, had been greatly damaged," &c.—*New Annual Register*, 1783.

vestige of soil, shrubs and large trees grow, insinuating their roots into every cranny of the rock in search of food ; or creeping on, or hanging down naked and unconnected, the sides of rocky precipices, and at length drawing their nourishment from soil forty or fifty feet below the trunk or stem of the plant. Generally, under this coat of soil there is a rocky substance, soft where it is connected to the soil, and hardening as it deepens. It is followed, in many places, by curious strata of argillaceous rock, which are separated from each other by strata or layers of black mould, frequently mixed with shells of the cochlea kind, and some marine productions of the testaceous tribe, particularly various turbines and bivalves. Alternate strata thus formed are often found in excavated places many hundred feet under the surface. They generally observe the inclination or angle which the hill or valley in which they are found, makes with the horizon : thus, some are oblique, others horizontal ; and in proportion to the depth, the hardness of the argillaceous strata increases. In other places, under the soil is a thick bed of stone, the production probably of volcanic

canic fire, of a deep brown or chocolate colour, and breaking into oblong, smooth, homogeneous quadrilateral masses, very regularly formed. These, as they deepen, become more soft and crumbly; but always retain their form, till at length they are so united with a yellowish earth, as scarcely to be distinguishable from it. In places excavated perpendicularly; and long exposed to the weather, these imperfect crystallizations, if they may be called such, are seen, separated from the earthy matter connecting them, and hanging in the manner of icicles, and displaying their form with the utmost exactness. In the yellowish earth underneath these quadrilateral masses, several stones of a bright shining blue are found single, and of a depressed oval shape. Many hills, particularly those which are of a conical form, have, under the soil, strata of a substance much resembling calx at first sight; but on examination, found to be calcined stones and ashes, compressed into laminæ. These laminæ are separated from each other by a greyish earth, mixed with innumerable small pebbles, much used in making mortar.

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The district of St. George's parish, called Point Saline, forming an isosceles triangle, the base of which may be four miles in length, is almost entirely composed of the soft rocky substance, called Tuff; and fully a third of it is destitute of soil, except here and there in little hollows and fissures; or where the surface of the tuf, softened by the action of the air, has become a kind of vegetative earth. The whole of this immense mass is made up of regular layers, or laminæ, inclining or horizontal, as the surface is acclivous or flat. Three conical hills, of about five or six hundred feet perpendicular height, situated in the midst of this, particularly those constituting what is called Morne Rouge, or the red mountain, are entirely composed of vitrified rocks and stones, of a black or brown colour, and scoriæ intermixed with an earth exactly resembling iron rust, reduced to powder. No trace, however, of the crater of a volcano can be perceived on any of them; but they are so placed, with respect to each other, as to form a very deep circumscribed hollow, which once perhaps was the crater of an immense volcano. The scoriæ, by the action of

of air, has been reduced in some patches of these hills, into a very fertile purplish soil, producing in seasonable years abundant crops of cotton.

None of these rocky substances effervesce with acids; so that they evidently possess nothing of the calcareous nature. The first I have mentioned, or the argillaceous strata, vary a good deal in colour; some being of a pure white, some yellowish, and others bluish: they are all smooth and soapy, or unctuous to the touch, free of grit, and dissolve readily in water. They are called by the Creole whites and negroes, Aboo and Caoo; probably corruptions of the two French words *boue*, signifying dirt or clay; and *craie*, chalk: and by African negroes, before they have acquired the language of their brethren in the West Indies, Treing: an Ebo word, signifying a purer kind of pipe-clay, much used with food by most of the inhabitants of the coast of Guinea. All these varieties are eat with astonishing avidity by negroes of almost every description, but particularly the females: a pernicious custom, originally superstitious perhaps, and certainly introduced from Africa. It is the most general cause of the

the fatal cacoehymic complaint among negroes, called here *Mal d' Estomac*.

Having thus given a general account of the appearance of the country, and its soil, I should now describe the various productions of Grenada, and more especially the medicinal plants, which abound everywhere; but although the subject is extremely curious, and merits a distinct treatise, I confess myself unequal to the task, Botany having never been my study, though frequently my amusement. To no country is the observation of the celebrated Mr. Ray more applicable than this, “Tales plantarum species in quacunque regione a Deo creantur quales hominibus et animalibus ibidem natis maxime convenient: imo ex plantarum nascentium frequentia se fere animadvertere posse quibus morbis quaelibet regio subiecta sit,” &c.— Every human want, except those introduced by European luxury, is here amply provided for, almost without exertion. The most wholesome food is the spontaneous production of the country. The various species of the banana, of the potatoe, of the pea, of

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the bean, of the cassada, stand unrivalled in salubrity and native elegance of taste. To these may be added a variety of pot-herbs and greens, unknown in Europe ; and at least sixty kinds of fruit, chiefly natives of the country, of the most delicious flavour and taste. To strengthen and give tone to the stomach, diminished by debilitating causes continually present, various peppers and grateful stimulating plants spontaneously present themselves. Is the traveller in the woods parched with heat, and languishing for diluting drink, the kindly water-withe and wild pine, are on every tree ready to assuage his thirst. Do the chilling northerly winds of winter check the perspiration and excite catarrhal complaints, many hundred plants well suited to remove them, are everywhere furnished by Nature. Do fevers prevail, the same kind Provider has amply bestowed on us the means of relief. Are ever any afflicted with dysenteries, certain means of cure are found in every field, in every wood, and even climbing on the most sterile rocks.⁵ No people are more afflicted

with

⁵ The bignonia capriolata, called by the French Griffe à Chat, is of this tribe ; is always found climbing on

with worms than the inhabitants of this country ; nor are any more bountifully supplied by the hands of Nature with specifics against them. Ulcers, so obstinate and troublesome in other regions, however malignant, must here yield to the native detersives and incarnants of the country. The loathsome yaws are cured by simples. The Venereal Virus has its antidotes⁶. The leprosy, the most dreadful of all diseases, is said to have its indigenous remedy, known to few besides the aborigines of the islands⁷. Although the inhabitants seldom require their aid, yet innumerable antiscorbutics are prepared by nature for the soldier and

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on bare rocks, and is even a specific in this very dangerous disease.

⁶ Among these may be mentioned euphorbia tithymaloides, the mal-nommé of the French ; that singular plant saururus cernuus, the herbe à colet of the French ; lobelia syphilitica ; and costus spicatus, a new species pointed out to me by that ingenious and indefatigable botanist, Mr. Anderson of St. Vincent.

⁷ This remedy, I am informed, is the saururus cernuus of Linnæus, the herbe à colet, and aguarima of M. Desportes. The Caribs are said to use it successfully, externally and internally, in this deplorable disease.

the mariner, worn down by long voyages and the scurvy. Every poisonous herb or tree have their use ; and are prevented from being mischievous, by an adjoining antidote. Nay the baneful effects of the manchineal may be prevented by the liberal and kind provision made by Nature. Does the imprudence or the ignorance of man lead him to the dangerous experience of the deadly juice of this alluring fruit, the sea is close at hand into which he instinctively plunges for relief, or the white trumpet-flower tree extends its branches, and intermingling them with those of its enemy, interposes its antidotal power. Nor is this most poisonous of all plants without its medicinal use ; for, by an easy and simple operation, its juice in the state of vapour extirpates those troublesome and obstinate fungi, the sequela of the yaws, called crabs and tubboes⁸. In short, what-ever

⁸ Sea-water I have repeatedly seen remove the dangerous effects of this poison ; and the bignonia lucoxylon (the white cedar of the country) is said to be also a certain antidote. The operation I allude to is this : A hole large enough being dug in the sand, alternate layers of charcoal and manchineal apples are laid in it. When the charcoal is well lighted, and a thick smoke arises,

ever can contribute to the ease and comfort of man; to his food, his drink, his medicine, his cloathing, his dwelling, his utensils of husbandry, his household utensils, his bedding; to the construction of his boats and canoes, are here abundantly, and in most instances spontaneously produced. “*Ipsa quoque immunis rastroque intacta, nec ullis saucia vomeribus, per se dabat omnia tellus.*” Nor is his food confined to the vegetable kingdom. Horned cattle, sheep, goats, hogs, rabbits, agootees or Indian conies, and guanas; dunghill-fowls, turkies, geese, ducks, Guinea-fowls, and house-pigeons, are at all times to be procured. At certain seasons, particularly in the autumnal months, there is not a scarcity of what may be called game, wood-pigeons, or ramiers, ring-

arises, the patient is made to place the diseased foot over it; and a piece of thick Osnaburgh is laid over all, to prevent the escape of the vapour. At the end of an hour the foot is removed, and the crabs, which before the application of the steam were hard and untractable, are now completely rotten, insomuch that without giving the least pain, they are picked out with a small pointed knife.

ring-tailed pigeons, snipes, tales, water-hens, wild ducks, plovers, blue and grey galdings, blackbirds, &c. But an inexhaustible supply of fish, of uncommon variety and goodness, may be throughout the whole year resorted to: all the rivers, bays, and sea teem with them; and being easily procured, they constitute almost the only animal food of the lower classes of people. Black, red, and grey snappers, rock-fish, groopers, Spanish mackerel, king-fish, ten-pounder, porgie, barracuta and pargue cavalloe, old-wife, seamullet, trunk, hog, bream, gar, ballahoo, jacks and sprats, silver ballahoo, parrot, butter-fish, maid, flounder, foal, a kind of herring, sun-fish, snook, carramaws, sting-ray and whip-ray, sennets, jew-fish (rare) yellow tails, conger-eels, turtle of three kinds, and a multitude of shell-fish, are among the best of the sea-fish. River mullet, mud-fish, crapaud or river toad-fish, silver eel, and innumerable cray-fish, the most esteemed of the fresh water fish.

It is not therefore surprising that foreign luxuries too liberally used, should shorten the lives of one description of inhabitants, whilst another, confining themselves to the whole-some

some indigenous aliment of the country, with occasionally the addition of the least injurious of the European delicacies, live to an age uncommon even in the temperate regions of the old continent. The old monastic rhyme is in all countries the best rule of diet :

“ Pone gulæ metas, ut sit tibi longior ætas ;
Ut medicus fatur, parcus de morte levatur.”⁹

but it is more especially so here, where great efforts are made by Nature in the assimilation of the European constitution to the tropic climate in the first instance ; and where diseases, mild among the indigenæ, or the assimilated of the country, become fatal to the imprudent stranger. In fact, it is this circumstance which has given rise in Europe to the prevailing idea of the unhealthfulness of these islands, and of Grenada in particular ; for the climate of Grenada, notwithstanding the variable temperature, occasioned by the irregularity of its surface, and the moisture of its atmosphere, is certainly healthy, compared to other coun-

• L'Ecole de Salerne, p. 87.

countries in the same latitude; and would prove so to every description of its inhabitants, were they all equally temperate, and equally careful to avoid those excesses in diet, which in all climates are dangerous, and often fatal. To prove this, no more is necessary than to attend to the uninterrupted health and great age of many of the French and Creole inhabitants of both sexes. Eighty, ninety, and an hundred years is by no means an uncommon age among these; and females are in general longer lived than males. One instance has occurred, of life being lengthened out to the 127th year¹⁰: an age not very far short of the famed instances of longevity of our own country; and, if the climates are considered, certainly more extraordinary. An anecdote lately related to me of this aged person, is uncommonly singular. M. Forthon lived on a coffee-state in that

¹⁰ "James Forthon, Esq. in the 127th year of his age, in Grenada. He was born at Bourdeaux in 1645, settled in the West Indies in 1694, married at St. Christopher, and removed to Martinique, where he remained thirty years, and has resided in Grenada forty. He retained his eye-sight till his 117th year, and his health till within a few days of his death."—*Annual Register, 1773, March.*

that part of the parish of St. George, called Foret Noire, or the black forest, about five miles from town. The gentleman who related the anecdote to me, with another, visited this old gentleman two or three years before his death. They found him employed in having a negro-wench flogged : and as he was blind, he was led to the place where the culprit lay, in order, by feeling, to know whether the punishment had been properly inflicted or not. Being satisfied in this point, he returned with a firm steady step to his seat. The cause of this punishment was still more extraordinary. A Mr. Maly, Mr. Forthon's grandson-in-law, assured my informant, that Forthon punished the wench, who acted as a kind of housekeeper to him, for refusing to admit of his embraces. —The French and Creole inhabitants are never afflicted with the fatal topical inflammations, often epidemic among the English and negroes ; nor do fevers of a bad kind ever appear among them. Their strength continues as unimpaired as their constitutions; so that it is no uncommon thing to see a very old Frenchman walk and ride with all the firmness and activity of youth.

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This does not appear to arise from their residence being cooler and higher than that of the English inhabitants; for many, possessing fine plantations on the coast, enjoy the same exemption from disease, experienced by the coffee-settlers on the mountains, although the difference of heat is as thirteen to rather more than seventeen.

Were we to exclude the effects of the miasma of the marshy districts, and those proceeding from the irregular temperature of the air, we should find that, in common years, there is by no means much sickness; and that in general it is only in those places where marshes are abundant, as in Marquis, Seauteur, and a few detached spots in other parts of the coast, diseases *mali moris* prevail. There indeed, one year with another, fully an eighteenth part of the inhabitants annually perish; but in other districts, where these dreadful causes of disease do not exist, the mortality is not more than one in 37 or 38.

The endemic diseases are either bilious, putrid, or inflammatory, as the seasons are hot and wet, or dry and cool. Thus, in
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the summer and autumnal months, or that portion of the year which includes the rainy and warm season, remittent fevers, dysenteries, slight colics, cholera morbus, phrenetic complaints, or what the French call *Coup de Soleil*, occasioned by the intense solar heat, ulcers of the legs, particularly those of the herpetic kind, are the most prevalent disorders. And in the marshy districts at this time of the year, obstinate and irregular intermittents, generally depending on glandular obstruction and visceral inflammation, remittents of the worst kind, and hepatic dysenteries, are very common, frequently epidemic, and too often fatal. During the winter and spring, when northerly winds blow, and occasion an uncommon and disagreeable chillness; but when the atmosphere is generally less moist than at any other time of the year, pleurisies, often attended with fever, catarrhal fevers, rheumatic fevers, ophthalmias, inflammatory anginas, erysipelas frequently preceded by fever, chronic rheumatism, and the Guinea-worm,¹¹

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¹¹ It will appear singular to the European reader, that the dracunculus, or Guinea-worm, should be classed among

are the most common epidemics. At all seasons, hepatic inflammation is very frequent ; and

among the epidemics of Grenada ; but however strange it may seem, it is nevertheless fully established by innumerable facts. One very extraordinary instance will suffice to show the propriety of considering this disease as one of the epidemics of the dry season. On the estates of Edmund Thornton, Esq. situated in the district of St. George's parish, called Point Saline, already described, and at the farthest extremity of it, the negroes are attacked regularly every year, about the beginning of November, with symptoms of the Guinea-worm. In the month of January the disease spreads throughout the greatest part of the gang ; and in the month of March it entirely disappears : and they continue exempted from it till the following November. The cause of this singular disease on the estates I have mentioned, seems to be confined to the water of some wells, which have been dug in the substance, called Tuf, of which the whole gang drink ; there being no springs or rivulets in the district, and unfortunately no cisterns to collect and preserve the rain water. This has been rendered evident by what has happened on some neighbouring estates ; the negroes of which, till of late, were as subject to this distressing complaint as those belonging to Mr. Thornton. The wells were filled up, cisterns built, or wells dug in places not subject to the influence of the flow and ebb of the tide ; and at the return of the usual period of the appearance of the Guinea-worm, nothing of the kind happened. They have

and when anomalous, always epidemic. Worms also are common throughout the year, and frequently give rise to very extraordinary symptoms. The yellow fever (properly so called) sometimes appears; but observes no particular season. Ruptures, ring-worms, elephantiasis, or the glandular disease of Dr. Hendy, hydrocephalus, yaws, putrid or ulcerous sore throats, mortification of the fingers and toes, chronic aphthæ leprosy,

have ever since (three years now) continued exempted from the disease. In the water which contains the embryos of the dracunculi, the naked eye distinguishes innumerable animalcules, darting in every direction with astonishing force and rapidity: these, on being subjected to examination in a small microscope, exhibit a very extraordinary figure, differing from any animalcules hitherto described. Till within these few years, this disease was considered as peculiar to that part of the coast of Guinea contained between Cape Coast Castle and Acras, about ninety miles in extent: and it was believed that the slaves from the Gold Coast were alone subject to it, and always brought it with them to the West Indies, but never contracted it there. This however has been proved to be without foundation; for the Creole-negroes are as subject to it as the Africans. Infants have it as well as the most aged; and no part of the body or extremities is exempted from it: the arms, legs, every part of the trunk, the scrotum, penis, and even the pudenda muliebria, within the labia.

leprosy, and tetanus, may be ranked among the sporadic endemics of this country, and are certainly not the least tremendous of them; but fortunately they are either confined to the negro race, or rarely occur. The species of tetanus peculiar to infants, and hence called *Trismus Nascentium*, is an endemic of this island, and always a fatal one: it prevails only in the marshy and moist parts of the island, and takes place any time before the ninth day after birth; after which period it has never been known to happen. It does not appear to arise from a retention of the meconium; for however carefully infants have been evacuated, the disease has in no instance been thereby prevented. From its prevalence in moist, cold, or marshy situations, we may with more propriety attribute it to cold and impure air. This dreadful malady admits of no cure; but we fortunately possess a most certain preventive. It is with singular pleasure I assign the discovery of this beneficial application to my worthy and experienced friend Dr. John Stewart, of this island. About five or six years ago, on an estate which this gentleman had the charge

charge of, the manager frequently mentioned to him the unfavourable circumstance of all the infants born on it dying of the locked jaw before the ninth day, and that this had uniformly been the event in every instance for many years, although every possible caution had been taken to prevent it. The plantation was situated in a valley, and consequently damp ; but in all other respects healthy. Observing that the negro midwives were not very nice in their choice of the instrument with which they cut the umbilical cord, he suspected that the rubiginous particles might produce such irritation as to cause the fatal disease in question. Having this in view, he directed the midwives to dress the part with a folded piece of soft linen, well smoaked in spirit of turpentine, instead of the common way. They attended to his directions ; and not a single infant has died on the estate since. The practice, in situations wherein this disease has occurred, has become general, and has been attended with success in every instance. It may not be useless to add, that several planters, both here and in Tobago, make use of this application to lambs, calves, and

and colts, with equal success. As many of these animals die soon after they are dropped in moist and marshy situations of this country, the adoption of this simple preventive may be a general benefit to the inhabitants.

The island is frequently visited by the small pox, sometimes of the confluent or malignant kind. It has in almost every instance been introduced from the coast of Africa, in the slave-ships ; on board of which it frequently breaks out, and commits dreadful ravages on the passage to the West Indies ; but as inoculation is always had recourse to at the time, or soon after this disease appears, the mortality occasioned by it is seldom considerable. The chicken-pox is common almost every year ; and as it appears without any evident introduction, it may be considered as more an endemic than a foreign disease. It is always mild, and requires no other treatment than a laxative at the turn, or when the pustules dry.

The measles and hooping cough seldom appear here ; for in the course of ten years I re-

I recollect only two instances of the former, and one of the latter: they were of a very bad kind, and proved fatal to many children.

No instance, as far as I have been able to learn, has occurred of a bite or sting of any poisonous reptile, snake, or serpent; and indeed of the latter there are only two kinds found, both of which are said to be harmless. Scorpions, scolopendras, a large species of spider called Tarantula, and two or three species of wasps, are sometimes troublesome, and by their stings occasion painful inflammations; but are never poisonous. The sting-rays very frequently inflict very dangerous wounds; and the prickles of the sea-eggs, often unperceived, give the unwary a shock as violent and unexpected as that of electricity. The little wounds they inflict, though not dangerous, are exceedingly troublesome and painful. The negroes make use of a very simple method of extracting these prickles; they place the patient's foot over a fire as close as possible, without burning, and when it is sufficiently heated, they rub it well with candle-

dle-grease, and repeat the operation three or four times ; they then wrap it up, and a few hours after, the prickles fall out. The pain ceases after the first application of the heat and grease.

I have already observed, that Grenada surpasses almost all the Windward and Lee-ward islands in the abundance and goodness of its water. I may add, that it also excels in its medicinal springs : some of these are hot, but the greatest number are cold. Of the former the most noted are those of Duquesne Valley, situated in the parish of St. Patrick. The temperature of the hottest of these springs is 116 degrees ; and from their habitudes with precipitants, compared with Bergman's Analysis,¹² they appear to contain a considerable portion of iron, magnesia, a mineral alkali, and common salt. Aerated acid is not indicated by lime-water, or the blue flowers of the vervein. Their finell is pretty much hepatised ; from which, and their heat, it is probable they contain a small portion of sulphur in a very volatile state. They have

¹² Bergman's Chemical Essays, Vol. I.

have been used frequently internally and externally, with considerable advantage in chronic rheumatisms, herpetic complaints, old ulcers, scrophula, and leprosy ; but they rise in a country so extremely rugged, and unfortunately so little attention has been paid to the road or path which leads to them, that much general benefit cannot be expected from them. Of the cold medicinal springs, the most remarkable are those of Montrose and the Hermitage, in the parish of St. Patrick ; and those of Beaugency, in St. George's parish. The temperature of all these is 78 degrees ; and from their habitudes with precipitants, they appear (particularly the two former) to contain a large portion of vitriolated magnesia and a mineral alkali. The Beaugency water appears to be true Seltzer, containing a much larger proportion of aerated acid than the former. Besides these springs, there are found in a few places, particularly on the Hermitage, mephitic exhalations, of a most pernicious nature. The Hermitage vapour issues from a small hole in the side of a rising ground, within a few yards of the river Antoine ; no water rises with it, but in issuing it makes a singular

gular hissing noise. Around the opening from whence this stream of mephitic air comes, a number of birds, lizards, and other small animals are found dead; and experiments have been made which prove its deadly influence on dogs and fowls.

The year in the West Indies is divided into two portions; the one called the Dry, the other the Wet season. Some divide each of these also into two; which they call the Long and Short winter, and the Short and Long summer. The latter division has been made by the French; but as it is not always observable, it will be sufficient barely to have mentioned it. What is generally understood by the expression Dry Season, is the portion of the year contained between the beginning of December and the end of April. The commencement and termination however of this season are not always observed to happen at those periods; for the rains may continue till the beginning of January, recur frequently during the vernal months, and set in again at the beginning of April; or not appear till June or July. It is fortunate however for the planter,

planter, that these deviations from the usual course of the season seldom occur; for, when they do, their effects are often fatally experienced on the extent of the crops. The dry season, in its ordinary course, is pleasant and healthy, the sky exhibiting a vast expanse of azure, uninterrupted by clouds or any dense medium, and the atmosphere being pure, dry, and temperate. It is almost constantly ushered in by northerly, or north-westerly winds, and these and north-easterly winds prevail with little variation the whole of its continuance; but are most chilly, dry, and boisterous in the months of December, January, and February. If however the wind, during this season, should in the day-time blow from any other point but those I have mentioned, it always towards the close of evening returns to a northerly point. Thus it sometimes happens in extraordinary years, that from 6 A. M. to 7 or 8 P. M. the wind is from a point between S. and E. or S. and W. but, at the latter hour, it suddenly veers round to the northward, and continues so till the following morning, when it again changes to the southward. The total

total suspension of vegetation during this season is surprising, and seems to be occasioned by the want of moisture, and the exsiccative shrivelling quality of the north-easterly winds. That it is to be attributed chiefly to the latter is evident, from the inefficacy of the rain which sometimes falls very plentifully in the dry months, in exciting a spring in vegetables: when however they are longer continued than usual, their vegetative power faintly discovers itself; but is never permanent. All deciduous trees are striped of their leaves; the pastures become parched and brown; the cane-fields lose their vivid green, and assume the autumnal hue of northern climes. The latter months of this season are the most pleasant of the year; Nature beginning to recover from the torpor in which she had been sunk, gives new life to the whole vegetable creation; and so great is the vegetative power displayed at this period, that leaves and blossoms are seen shooting forth on the same tree, with fruits already formed, and fast approaching to maturity. Nothing can equal the delightful freshness of the mornings, and the softness of the evenings
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of April and May, in this season. The atmosphere is dry, cool, and saturated with the perfume of a thousand blossoms; verdure is universal, and tempered with the softest tints of spring; the winds are gentle and soft, and never charged with the sultry heats of July.

The rainy season includes the summer, autumn, and generally the first month of winter; its approach is awful, and always indicated by thick fog resting on the tops of the higher mountains: this is soon followed by heavy, black, watery clouds, slowly rolling along from the north-east, in terrific volumes, enveloping the mountains, and darting bright electric coruscations from their edges. These clouds, sometimes bursting in the mountainous tracts, are suddenly converted into torrents of water, which frequently, inundating the country below, commit considerable devastation in their progress; a body of water, not unfrequently six feet high, rolling down the beds of the rivulets, carries every thing before it, and discolours the sea several miles in every direction from their mouths, with the ochry

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earth of the interior country. But although this portion of the year is called the rainy season, to distinguish it from that just described, we are not to imagine that it is composed of a continued series of rainy weather, comfortless, gloomy, and never brightened by the cheerful rays of the sun. Many successive days occur of dry weather; and it sometimes happens, that the length of time without rain endangers the success of the planters exertions. These dry tracts chiefly occur in August and September, and are almost unsupportably sultry and close. The rains fall in astonishing quantities; — but as I unfortunately possessed no means of measuring it, I cannot with precision say what the average quantity is: no idea however can be formed of it from what falls in Europe. During the rainy season, southerly, easterly, and westerly winds prevail, and are always hot and sultry.

The months of March and September, when the equinoxes happen, are particularly stormy; the winds are uncommonly boisterous, but generally unaccompanied with rain.

rain. Gusts such as are every autumn and spring experienced in the continent of North America, are never known to happen here; and hurricanes, which often lay waste the sister colonies to the northward, seldom occur in Grenada; or if they do, they are little more violent than common gales of wind. The dreadful hurricane of the year 1780, which proved so destructive in Jamaica, Barbadoes, Antigua, Dominica, St. Vincent, and the French islands, did no other damage here than throwing down some trees, and a few old buildings. A few neutral vessels indeed were driven ashore in the carenage; but it was an event to be attributed entirely to the negligence of their captains.

The regular succession of sea and land-breezes, so constantly observed in the larger islands, and on the continent, never occurs here: but there are two periods in the twenty-four hours, during which there is a perfect calm, and consequently a very disagreeable oppressive heat, from eight till ten in the morning, and from two till four in the afternoon.

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That northerly and easterly winds are the most prevalent, is demonstrated by the manner in which all the trees on the eastern side of the mountains are bent: they are all, particularly those growing on the most exposed situations, stinted and dwarf; and their branches are inclined to the southwest. Next to these is the southerly; and the least frequent is the westerly.

Lightning, and its consequence thunder, are phenomena not so frequent in Grenada as the situation of the island and its high conical mountains might induce us to expect; nor are the flashes and the explosions so tremendous, by any means, as they are in the southern states of North America. It seldom happens that lightning is the cause of much mischief here; for in the course of twelve years, I know of only two instances of its mischievous effects. In the dry season they never occur: they are generally preceded by whitish clouds hanging on the sides and tops of the mountains, in the form of huge bales; and fleecy clouds dispersed in various forms throughout the sky. Southerly winds accompany them generally.

The thermometer I used is a mercurial one, graduated by Fahrenheit's scale, and made by Fraser, London. The hall in which it hung is reckoned one of the coolest rooms in St. George's, situated on the summit of the part of the town called The Hill : it was almost constantly exposed to a current of air, which passed between the door and one of the windward windows ; and the height of the mercury in the tube was almost always taken at 7 A. M. at 1 P. M. and at 10 P. M. The choice of these periods in the twenty-four hours, arose from my observation of the following fact : At 7 A. M. the heat begins to increase, and continues to do so till 1 P. M. ; from which time till 4 P. M. it is stationary ; it then begins to diminish, and continues to do so till about 10 P. M. ; from which till 7 A. M. it is again stationary. This routine of temperature is disturbed only when any remarkable change takes place in the atmosphere, such as much rain, attended with strong wind ; and during some part of the dry season, when, as I have already observed, south-easterly winds are succeeded at night by northerly ones. Thus, from

the latter cause, the thermometer sinks in the course of the night two, three, or four degrees; so that when it is 80 at 10 P. M. it will be only 76, 77, or 78, at 7 of the following morning, in January, February, and March. A fall of rain, accompanied with wind, has a very remarkable effect on the thermometer. The greatest change I ever observed was ten degrees; the least, four; so that the medium may be about seven degrees. These changes are most frequent in the summer and autumnal months, when the rains fall in greatest abundance: and when there is often an alternate succession of rain with cold, and dry weather with heat. It may not be unnecessary to observe, however, that during rain, should the atmosphere remain still, the thermometer continues at the same height as before it began to rain. I have repeatedly observed this, even when the quantity of rain has been very considerable; and it is a phenomenon which should not surprise us, since we know the great share which winds, or currents of air, have in evaporation, and this in the production of cold.¹³

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¹³ See Essays and Observations, Physical and Literary, Vol. II. p. 159.

When I have exposed the thermometer to the direct rays of the sun, in an inclosed yard, where the wind could have little effect upon it, the mercury has risen in ten minutes to 130 degrees, or 42 degrees above its stationary point at noon, in the hall where the instrument was before suspended; but as the reflection from the walls of the yard might considerably increase the heat, I did not consider this as a fair trial of the natural heat of the sun. I have therefore frequently, on clear days, suspended the thermometer in a gallery, directly exposed to the sun's rays, and found that the mercury rose to 113 degrees, and once to 120 degrees at noon, or generally about 30 degrees above the usual height in the shade at noon.

Another thing to be observed, is the difference between the heat of the air at the hottest time of the day, and during the night; or the periods during which the thermometer is generally stationary. The medium of the heat in the shade at noon, or 1 P. M. is about 83, 30; at night 74; so that in general the difference is about
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9 degrees. I have not found that the degree of heat in the ground, and first floors of my house, differed much from that in the upper, which was covered with a tiled roof: and consequently the air contained in it we would expect should be more affected by the heat of the sun than the lower floors. In general, this difference has never exceeded 1 degree.

I may here take notice of the difference of temperature produced in water, by the heat of the atmosphere, during the day and night. It shews how extremely sensible the human body is to the smallest deviation, from the usual heat it is exposed to; and that our sense of cold, in this climate, is merely relative. At 10 P. M. into a Spanish unglazed earthen guglet (of that kind generally used here for cooling water) full of water, I plunged a small thermometer: in five minutes the mercury sunk 3 degrees, its stationary point then, in the open air, being 82 degrees. I then placed the guglet in an open window, where it was left till 6 A. M. On plunging the thermometer into the water, the mercury sunk to 72 degrees, or 10 degrees lower than its stationary

tionary point during the night. This degree of coolness in the water was, to my taste, rather cold and chilling. At 1 P. M. I plunged the thermometer into a guglet of water which had been standing in the shade all the forenoon, when the mercury fell to 82 degrees, or 2 degrees lower than the heat of the room at that time. It is to be observed, that the guglets used here, for the purpose of cooling water, are brought from South America, are porous, and of course a considerable evaporation takes place from all their external surface.

It is not at all surprising that this country should be subject to earthquakes. The conical hills and mountains into which the surface of the island is divided ; the lakes¹⁴

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¹⁴ One of these, called the Grand Etang, or Great Lake, to distinguish it from another on the windward side of the island, is situated in a circular basin, cut out of the summit of the highest mountain of the island. It is about a mile in circumference ; and its depth is, in general, about 14 feet. The other, called the Lake of the River Antoine, retains the appearance of an extinguished volcano, much more perfectly than the Grand Etang. The hollow which contains it is perfectly circular, and gradually slopes from the brim to the edge of the water, which is of very considerable depth.

contained in what have every appearance of having been once the craters of immense volcanos ; the regular horizontal strata of the substance called Tuf, which seems still to retain many of the distinguishing marks of lava ; these and several other peculiarities to be observed in the structure of this as well as most of the windward islands, give us room to believe that volcanos did once exist in them ; and we know that where volcanos are, or have been, earthquakes are very frequent. In the course of the three first years of my residence in Grenada, there were five earthquakes. The first and most violent happened on the 22d of December, 1784, about 2 P. M. In St. George's it continued about a minute and a half, and ran from about N. N. W. to S. S. E. It shook the earth in a violent manner, and when strongest, occasioned an undulating motion of the surface. It was attended with a hollow rumbling noise, like distant thunder. The atmosphere was still and close while it lasted ; the thermometer 82. The sea did not appear to be in the least agitated. The marshes at Calivini were much agitated by it ; for the motion of their surface

surface was perceived to be very great, and to continue some time after the shock ceased. On the windward side of the island, the shock continued about two minutes; and was much more violent than in town. The captain of a ship, at that time off the coast of the island, said, the sensation which the shock occasioned on board, was similar to that of the ship's bottom rubbing against rocks; but that the sea was not agitated. The same was observed by some gentlemen going to Cariacou. On the 24th of April, 1785, about 40 minutes past six A. M. a shock of an earthquake was felt, which lasted only about two seconds; but about 20 seconds after, a second was felt, which continued a little longer. It was very gentle, was not general, and appeared to run from N. N. W. to S. S. E. The morning was calm. On the 26th of May, about midnight, a shock was generally felt, running from about W. to E.; it continued about 30 seconds, and shook the houses very considerably. On the 29th of the same month, about 10 P. M. another shock was generally felt, and continued about 20 seconds. And on the 16th of January,

1786,

1786, in the morning, three shocks were perceived running from N. N. W. to S. S. E. the two first were very slight; but the third was violent. During the seven last years, not a single shock has occurred: an extraordinary circumstance, considering their frequency in the preceding years. In those islands, however, on which the volcanic appearances are more perfect than they are here, such as St. Vincent, St. Lucia, and Dominica, earthquakes are much more frequent and violent.

Water-spouts are very rarely seen around Grenada; for during the last ten years, I recollect only two.

The barometer does not appear to be affected much in this climate. A moist atmosphere, with southerly and westerly winds, makes the mercury to sink a little; and northerly winds, with a dry cold atmosphere, make it rise. But notwithstanding the irregularity of temperature, and the moisture (which prevails more or less throughout the whole year here) of the atmosphere, the greatest range of the barometer during any

any year, has not exceeded one inch and five-tenths. This is, however, considerably greater than that which happens at Barbadoes, where the greatest range is not more than half an inch. In uncommon years, when a long continuance of northerly winds produces a degree of cold in the atmosphere extremely disagreeable to our feelings, the barometer has stood for a month together at 30 degrees. In the months of July and August, when much rain falls, it has continued at 28: 5 several days successively; and the atmosphere then is insufferably close.

I have already mentioned, that it was not in my power to determine the quantity of rain, owing to my not being possessed of the proper instruments; but with a view to remedy this defect, I have, following the example of the late Dr. Cleghorn in his account of the weather at Minorca, marked the rainy days, and the proportion they bore to each other, by dots. Thus, drizzling rain is denoted by ·, showery by ··, heavy rain by ···, and excessive rain by ····

Having premised these general observations on the face of the country, on the productions, on the endemic diseases, and on the weather of Grenada, I shall now proceed to describe the changes which took place in each month of the years 1784, 1785, 1786, and 1793; and subjoin a table of the highest, lowest, and medium height of the thermometer during that time.

1784.

JANUARY. My observations on the weather commenced on the 22d, from which, till the end of the month, the weather was in general dry; the atmosphere too was clear, pure, and agreeably warm.

Rainy days, 25th, 30th, and 31st..	
Wind, { 8 days Northerly. Therm. H. 85 }	M. 83
{ 2 days N. E.	L. 81 }

FEBRUARY. Although this month began with heavy rain, yet it was generally dry, and in temperature similar to the last.

Rainy days, 1st.... 3d, 4th, 12th, and 29th ..	
Wind, { 10 days Southerly. Therm. H. 85 }	M. 83
{ 19 days Northerly.	L. 81 }

MARCH.

MARCH. The first week of this month was remarkable for the boisterous N. Easterly wind which prevailed. The remainder of the month was in general dry; sometimes calm and suffocating; but the atmosphere, though thus still and sultry, was temperate with regard to heat.

Rainy days, 3d . . .	12th, and 22d . .
Wind, { 19 days Northerly.	Therm. H. 86 }
{ 8 days Southerly.	L. 83 }
{ 4 days Easterly.	M. 84 .

APRIL. Several days of this month were rainy, and the certain presage of the approach of the wet season, fog on the tops of the highest mountains began to appear on the 2d. The atmosphere in general was loaded with vapour, and its temperature became warmer.

Rainy days, 2, 3, 16, 20, 21, 22, 23, 24, 25, 29, 30 . .	
8, 17, 19, and 27 . . .	
Wind, { 3 days Northerly.	Therm. H. 86 }
{ 18 days Southerly.	L. 81 }
{ 9 days Easterly.	M. 83 $\frac{1}{2}$

MAY. Almost the whole of this month was rainy, and, being windy at the same time, the temperature of the atmosphere was generally cool, though the heat indicated

cated by the thermometer was much greater than during the preceding month. Much thunder and lightning towards the middle and end of the month.

Rainy days, 1, 2, 3, and 4 . . . 10, 11, 12, and 15 . . .
from 19 to 30 . . .

Wind, { 23 days Southerly. Therm. H. 87 } M. 84 $\frac{1}{2}$
7 days Easterly. L. 82 }

JUNE. Excepting a few days about the middle, the whole of this month was also rainy, attended with considerable variations of the thermometer, the mercury during rain falling to 76 as on the 25th, and rising afterwards to 84.

Rainy days from 1 to 10 from 11 to 17 .
17, 18 from 20 to 25 30

Wind, { 17 days N. E. Therm. H. 86 } M. 85
14 days Easterly. L. 84 }

JULY. The greatest part of this month like the last, only towards the middle much boisterous wind from S. E. E. and N. E. Several days atmosphere still and suffocating. Some thunder and lightning.

Rainy days, 1, 2, 3, 4, 6, 7, 8, 9, 10, 17, 18, 20, 21,
22, 23, 24, 30 . . . 12, 19, 25, 26, 27, 28 . . .

Wind, { 11 days N. E. Therm. H. 87 } M. 84 $\frac{1}{2}$
12 days Southerly. L. 82 }
8 days Easterly.

AUGUST. Except two or three days, this month was remarkably rainy, with scarcely any wind, and consequently very great heat. Much thunder and lightning.

Rainy days, the whole except 5, 6, 21, 27,

SEPTEMBER. This month, like August, had only a few days dry weather; and the thunder and lightning were infinitely more tremendous. On the 2d the lightning, being particularly frequent and sharp, struck the powder magazine of Richmond Hill fort, damaged the work very considerably, and killed four soldiers of the 60th regiment.

Rainy days, 2, 9, 11 . . . 3, 4, 5, 6, 10, and from 12
to 30 . .

Wind, 30 days Easterly. Therm. H. 86
L. 81 } M. $83\frac{1}{2}$

OCTOBER—Was rainy also, and in general calm. No thunder or lightning.

Rainy days, from 1 to 6, from 9 to 14, and from 21 to 25 . . . 7, and from 15 to 19 . . . 8, 20 . . .

Wind, { 11 days N. E. Ther. H. 88 } M. 85
 { 10 days Southerly. L. 82 }
 { 10 days Easterly.

NOVEMBER

INTRODUCTION.

NOVEMBER—Was much the same, but without heavy rain.

No account taken of the rainy days.
 Wind, 30 days Northerly. Therm. H. 84 } M. 83
 L. 82 }

DECEMBER. This month in general pleasant and temperate during the day; but the sudden change in the temperature of the air during the night, rendered that season disagreeable. Thermometer generally fell to 74 degrees in the night. Earthquake on the 22d.

Rainy days, 4, 5, 12, 13, 14, 19, 22, 25, 28, 30, 31 . . .
 23, 24 . . .

Wind, { 28 days N. E. Therm. H. 84 } M. 82 $\frac{6}{7}$
 3 days S. W. L. 78 }

1785.

JANUARY. This year began with rain: a circumstance very uncommon. The atmosphere, though generally clear, was cool.

Rainy days, 4, 5, 6, 8, 9, 10, 11, 12, 16, 18, 20, 22,
 24, 26, 28, 30 . . .

Wind, 31 days Northerly. Therm. H. 82 } M. 80 $\frac{1}{2}$
 L. 80 }

FEBRUARY. Except one day, the whole of February was dry, with sometimes a ful-

fultriness in the day-time, and chill during the night, but especially towards morning.

Rainy day, 8 . .

$$\text{Wind, } \left\{ \begin{array}{l} 26 \text{ days Northerly.} \\ 2 \text{ days Westerly.} \end{array} \right. \quad \begin{array}{l} \text{Ther. H. 85} \\ \text{L. 82} \end{array} \right\} \text{M. } 82\frac{2}{8}$$

MARCH. The first ten days were dry and agreeable; the rest in general rainy, with boisterous northerly winds towards the end. Atmosphere loaded with vapour.

Rainy days, 11, 14, 15, 16, 22, 24, 25, 27, 28, 29 . . .

26 . . .

$$\text{Wind, } \left\{ \begin{array}{l} 16 \text{ days N. E.} \\ 11 \text{ days N. W.} \\ 4 \text{ days Easterly.} \end{array} \right. \quad \left. \begin{array}{l} \text{Therm. H. } 85 \\ \text{L. } 83 \end{array} \right\} \text{M. } 83\frac{10}{11}$$

APRIL—Was in general dry, but excessively windy from the eastward.

Rainy days, 14, 30 19, 23, 24, 25, 26 . .

Wind, { 3 days Northerly. Ther. H. 85
 27 days Easterly. L. 80 } M. 81 $\frac{1}{2}$

MAY—Was generally rainy, with boisterous gales from N. E. and E. Atmosphere loaded with vapour, and frequently hot and suffocating. Towards the end of the month two earthquakes, and some thunder and lightning.

Rainy days, 1, 2, 3, 4, 24, 25, 26 . . . 5, 6, 9, 10, 11,
14, 15, 16, 20, 21, 22, 23 . . .

Wind, { 6 days Northerly. Ther. H. 87 } M. 84 $\frac{1}{2}$.
 { 22 days Easterly. L. 83 }
 { 3 days calm.

JUNE.

JUNE. This month was frequently wet, warm, and squally, particularly about the middle, with some thunder and lightning.

Rainy days, 1, 4, 5, 10, 11, 16, 21, 30 . . . 6, 7, 8,
17, 18, 20, 22, 23, 24, 27 . . .

Wind, { 1 day Northerly. Ther. H. 87 } M. 84 $\frac{5}{10}$
29 days Easterly. L. 81 }

JULY. For the most part rainy, calm, and sultry, with frequently thick fog.

Rainy days, 8, 11, 14 . . . 4, 9, 10, 12, 15, 16, and
from 21 to 31 . . .

Wind, { 2 days S. W. Therm. H. 86 } M. 84 $\frac{2}{10}$
28 days Easterly. L. 84 }

AUGUST. Few days of this month were rainy. The weather particularly at the beginning and towards the end, was remarkably dry, calm, and sultry, with a great deal of thunder and lightning, unaccompanied with rain.

Rainy days, 6, 10, 25, 26 . . .

Therm. on the 24th, 88; on the 26th, 78.

Wind, { 6 days S. W. Ther. H. 88 } M. 80 $\frac{25}{30}$
15 days Easterly. L. 78 }
10 days calm.

SEPTEMBER—Began with dry serene weather; but after the first week it suddenly changed to the most tempestuous since January,

nuary, 1784, and continued so till the end of the month. The wind frequently blew from almost every point of the compass, attended with thunder and lightning, and such prodigious falls or rather floods of rain, as overflowed the low lands, and did very considerable damage. The thermometer too varied very much. It was twice at 89 degrees, and once at 90, and, at one time, as low as 78 degrees at noon.

Rainy days, 9, 10, and from 12 to 27

28, 29, 30 . . .

Wind, { 11 days Easterly. Ther. H. 90 } M. 86 $\frac{4}{5}$
 { 19 extremely vari- L. 78 }
 able and violent.

OCTOBER—Was altogether rainy, cloudy, and chilly. On the 8th the mercury sunk to 74 degrees at noon.

Rainy days 8 the rest . .

Wind, { 12 days Northerly. Ther. H. 85 } M. 80
 { 2 days S. W. L. 74 }
 { 17 days Westerly. }

NOVEMBER. This month was generally rainy also, and sometimes extremely tempestuous. The low lands were often inundated.

Rainy days all, except 19, 20, 21 . . .

Wind, 30 days N. E. Ther. H. 84 } M. 80 $\frac{1}{2}$
 L. 80 }

DECEMBER. Former part of the month dry and pleasant, with easterly winds; latter part extremely rainy and stormy, with southerly winds.

No account taken of the rainy days.

Wind,	$\left\{ \begin{array}{l} 15 \text{ days Easterly.} \\ 16 \text{ days Southerly.} \end{array} \right.$	Ther. H. 88	$\left\{ \begin{array}{l} M. 81\frac{1}{2} \\ L. 75 \end{array} \right.$
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1786.

JANUARY—Was in general dry, and remarkable for the boisterous N. W. and northerly winds which prevailed almost throughout the whole month, and the uncommon chillness and dampness of the air during the night, the thermometer being then almost uniformly at 74, a heavy dew, and the wind always northerly. An earthquake on the 16th.

Rainy days, 13, 14, 15 . . .	16, 17, 18 . . .		
Wind,	$\left\{ \begin{array}{l} 25 \text{ days N. W.} \\ 6 \text{ days S. E.} \end{array} \right.$	Ther. H. 84	$\left\{ \begin{array}{l} M. 83\frac{1}{2} \\ L. 82 \end{array} \right.$

FEBRUARY. The weather continued in the same state.

No account taken of the rainy days.			
Wind, 28 days Northerly.	Ther. H. 84	$\left\{ \begin{array}{l} M. 83\frac{1}{2} \\ L. 82 \end{array} \right.$	
MARCH.			

MARCH. The former part of the month much the same also ; the latter warmer, with the wind more southerly.

No account taken of the rainy days.

Wind, $\left\{ \begin{array}{l} 14 \text{ days Northerly. Ther. H. } 86 \\ 17 \text{ days Southerly. L. } 83 \end{array} \right\}$ M. 84

APRIL. The first part of the month rainy and windy ; the latter warmer and drier, but equally windy from N. W. W. and S. W.

No account taken of the rainy days.

Wind, $\left\{ \begin{array}{l} 10 \text{ days Northerly. Ther. H. } 86 \\ 11 \text{ days Southerly. L. } 83 \\ 9 \text{ days Westerly.} \end{array} \right\}$ M. $84\frac{1}{2}$

MAY—Began with dry pleasant weather ; but in general it was very variable, with lowring clouds from the N. E. and fog on the tops of the mountains.

No account taken of the rainy days.

Wind, $\left\{ \begin{array}{l} 25 \text{ days Northerly. Ther. H. } 86 \\ 6 \text{ days Easterly. L. } 85 \end{array} \right\}$ M. $84\frac{1}{2}$

JUNE. A few days of the beginning pleasant ; from the 8th to the 17th, variable ; afterwards till the 27th, almost constant heavy rain, with heavy black clouds from the N. E. The rest of the month pleasant.

Rainy

Rainy days, 9, 10, 12, 15, 16, 17 . . .
from 18 to 27 . . .

JULY. Almost the whole of the month of July very rainy, warm, and sometimes suffocating. On the 6th, in the morning, when dry, thermometer 86; at noon, when very heavy rain fell, 76; soon after, 84; and, late in the evening, stationary at 82.

Rainy days, from 1 to 4, 9, 10, 12, 13, 15, 16, 20, 21,
23, 24, 25, 26, 27, 28, 29, 30, and 31 ..
6, 17, 18, 19, 22, 5, 7

Wind, { 8 days Northerly. Ther. H. 88
 8 days Southerly. L. 76 } M. 87⁷⁷
 15 days Easterly.

AUGUST—Was altogether rainy; but towards the end the rain fell in prodigious quantity, and accompanied with a great deal of thunder and lightning, and squalls of wind from S. E.

Rainy days, 1, 3, 4, and to 20 . . . 25, 26, 27 . . .
 2, 21 to 24 . . . 28, 29, 31
 Wind, { 28 days Southerly. Ther. H. 87 } M. 82²⁸
 { 3 days Easterly. L. 78 }

SEPTEMBER. The violence and long continuance of the heat, and the almost constant dryness

dryness of the weather during this month were so uncommon, that men who had lived upwards of forty years in Grenada, and the other West India Islands, could not recollect any year equally remarkable. On six days the thermometer rose to 90; on fifteen to 89; and on three to 88.

Rainy days, 2, 4, 13, 19, 30 . . . 3, 17 . . .

Wind,	$\left\{ \begin{array}{l} 14 \text{ days Southerly.} \\ 9 \text{ days Easterly.} \\ 5 \text{ days Westerly.} \\ 2 \text{ days calm.} \end{array} \right.$	$\left. \begin{array}{l} \text{Ther. H. } 90 \\ \text{L. } 84 \end{array} \right\} \text{M. } 88\frac{11}{15}$
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OCTOBER. The first week of this month was exactly similar to the whole of the last; but afterwards there was much rain, with gusts of wind, and sometimes thunder and lightning. More rain fell during the night than at any other time; and then, particularly towards the end of the month, we had excessively boisterous south-easterly wind.

Rainy days, 5, 10, 11, 12, 13, 14 . . . 15 to 18, and
20 to 24 . . . 9, 24 to 31 . . .

Wind,	$\left\{ \begin{array}{l} 1 \text{ day Northerly.} \\ 10 \text{ days Southerly.} \\ 11 \text{ days Easterly.} \\ 8 \text{ days Westerly.} \end{array} \right.$	$\text{Therm. H. } 90$
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NOVEMBER—Began with heavy rain and boisterous south-easterly winds, which were more

more particularly so during the night ; and then accompanied with thunder and lightning. The rest of the month, except a few days about the middle and end, was dry and tolerably pleasant.

Rainy days, 1, 3, 4, 7, 16, 17, 25, 26, 27 . . .
2, 5, 6

Wind, $\left\{ \begin{array}{l} 1 \text{ day Northerly.} \\ 12 \text{ days Southerly.} \\ 13 \text{ days Easterly.} \\ 4 \text{ days Westerly.} \end{array} \right.$ Ther. H. 88 } M. 83 $\frac{2}{3}$
L. 78 }

DECEMBER—Was in general rainy, and sometimes extremely tempestuous ; N. W. and N. E. winds chiefly prevailing, occasioned a disagreeable coolness in the air, which was most remarkable during the nights and mornings.

No account kept of the rainy days.

Wind, $\left\{ \begin{array}{l} 15 \text{ days Northerly.} \\ 14 \text{ days Easterly.} \\ 2 \text{ days Westerly.} \end{array} \right.$ Ther. H. 86 } M. 84 $\frac{2}{3}$
L. 77 }

INTRODUCTION.

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1793.

JANUARY. Generally rainy, with north-easterly winds.

No account taken of the rainy days.

	Morn.	Noon.	Even.
Therm. H.	81	89	83
L.	77	83	78
M.	79	86	80 $\frac{1}{2}$

FEBRUARY. Generally rainy (an uncommon circumstance) with north-easterly winds.

No account taken of the rainy days.

	Morn.	Noon.	Even.
Therm. H.	82	88	82
L.	77	81	77
M.	79 $\frac{1}{2}$	84 $\frac{1}{2}$	79 $\frac{1}{2}$

MARCH. The first few days showery; afterwards mild and pleasant, with easterly and southerly winds.

No account taken of the rainy days.

	Morn.	Noon.	Even.
Therm. H.	80	87	82
L.	79	80	76
M.	79 $\frac{1}{2}$	83 $\frac{1}{2}$	79

APRIL.

APRIL. Very little rain, and more mild than March.

No account taken of the rainy days.

	Morn.	Noon.	Even.
Therm.	H. 82	87	82
	L. 78	84	78
	M. 80	85 $\frac{1}{2}$	80

MAY. Dry and dusty till the 16th, afterwards rainy; and on the 30th thunder and lightning for the first time. Wind generally S. E.

Rainy days, 16, 24 from 16 to 24, and from 29 to 31

	Noon.	Morn.	Even.
Therm.	H. 82	87	84
	L. 79	80	80
	M. 80 $\frac{1}{2}$	83 $\frac{1}{2}$	82

JUNE—Was, three or four days excepted, rainy throughout, with frequently heavy squalls from the S. E. and much thunder and lightning.

Rainy days, 1, 2, 8, 9, 15, 16, 17, 21, 27, 28 . . . 3, 4, 5, 11, 13, 19, 20, 30 . . . 10, 14, 22, 26, 29 . . .

	Morn.	Noon.	Even.
Therm.	H. 82	87	82
	L. 77	77	77
	M. 79 $\frac{1}{2}$	82	79 $\frac{1}{2}$

JULY.

JULY.—Till about the 11th, was dry, but squally from the eastward. The rest of the month rainy, with north-easterly winds, and much thunder and lightning; mountains generally enveloped in fog, and atmosphere loaded with vapour.

Rainy days, 4, 5, 6, 15, 17, 22, 23 . . . 13, 16, 3 . . .
11, 19, 20, 21, 24, 25, 26, 27, 30 . . .

	Morn.	Noon.	Even.
Therm.	H. 81	88	83
	L. 77	77	78
	M. 79	82 $\frac{1}{2}$	80 $\frac{1}{2}$

AUGUST. Very little rain fell during this month; but the atmosphere was generally excessively close, sultry, and loaded with vapour. The winds were very variable; but for the most part a calm. Some thunder and lightning.

Rainy days, 21, 29 . . . 10, 11, 20, 26 . . . 22 . . .

	Morn.	Noon.	Even.
Therm.	H. 82	89	85
	L. 78	80	79
	M. 80	84 $\frac{1}{2}$	82

SEPTEMBER. The greatest part of this month remarkably rainy, attended frequently with most vivid lightning and tremendous thunder, and violent squalls from the

the S. E. The heat was very variable; and on the 5th, greater than I ever observed it. At 11 A. M. the mercury rose to 88; at 1 P. M. to 92; at 4 P. M. it fell to 89; and at 10 P. M. to 84. As this heat was not attended with rain, and as no clouds interposed, every living creature was oppressed in an uncommon degree by it. The wind generally southerly.

Rainy days, 4, 12, 20, 23 . . . 11, 16, 17, 30 . . .
2, 3, 8, 13, 19, 27, 28, 29 . . .

	Morn.	Noon.	Even.
Therm. H.	83	92	84
L.	79	80	78
M.	81	86	81

OCTOBER. Much rain fell this month also; but not in the violence of last month. Squally from S. E.; and some thunder and lightning.

Rainy days, 16, 22, 24, 27 . . . 10, 11, 12, 13, 14, 23,
30 . . . 17, 25, 30 . . .

	Morn.	Noon.	Even.
Therm. H.	84	90	86
L.	77	80	78
M.	80 $\frac{1}{2}$	85	82

NOVEMBER. Five days excepted, the whole of this month uncommonly rainy; the sky almost continually obscured by heavy, black clouds; and the mountains enveloped in white clouds. A great deal of thunder and lightning. The wind chiefly S. E.

Rainy days, 2, 15, 19, 20, 23 . . . 4, 7, 9, 10, 14, 17,
21, and from 24 to 29 . . . 5, 6, 8, 11, 12, 13, 16,
22 . . .

	Morn.	Noon.	Even.
Therm. H.	82	88	82
L.	76	78	78
M.	79	83	80

DECEMBER—Was also very rainy; and, contrary to the usual course of the seasons, southerly winds prevailed. No thunder or lightning.

Rainy days, 2, 3, 4, 12, 13, 17, 23, 26, 29 . . .
21, 22, 25, 28, 30 . . .

	Morn.	Noon.	Even.
Therm. H.	81	88	82
L.	77	80	77
M.	79	84	79 $\frac{1}{2}$

A TABLE, shewing the greatest, least, and medium Height of the Mercury in each Month of the Years 1784, 1785, 1786, and 1793, at St. George's, Grenada.

Months.	1784.			1785.			1786.			1793.		
	H.	L.	M.	H.	L.	M.	H.	L.	M.	7 A. M.	1 P. M.	10 P. M.
January.	H.	85	82	84	81	89	81	83	83	81	83	83
	L.	81	80	82	77	83	77	78	78	77	78	78
	M.	83	80 $\frac{1}{3} \frac{6}{7}$	83 $\frac{1}{3} \frac{1}{7}$	79	86	79	80 $\frac{1}{2}$				
February.	H.	85	85	84	82	88	82	82	82	81	82	82
	L.	81	82	82	77	81	77	77	77	76	77	77
	M.	83	82 $\frac{2}{2} \frac{2}{7}$	83	79 $\frac{1}{2}$	84 $\frac{1}{4}$	79 $\frac{1}{2}$					
March.	H.	86	85	86	80	87	80	82	82	81	82	82
	L.	83	83	83	79	80	79	80	80	79	80	80
	M.	84	83 $\frac{1}{3} \frac{6}{7}$	84	79 $\frac{1}{2}$	83 $\frac{1}{2}$	79 $\frac{1}{2}$	83 $\frac{1}{2}$				
April.	H.	86	85	86	82	87	82	82	82	81	82	82
	L.	81	83	83	78	84	78	78	78	77	78	78
	M.	83 $\frac{1}{2}$	81 $\frac{1}{3} \frac{6}{7}$	84 $\frac{1}{2}$	80	85 $\frac{1}{2}$	80	85 $\frac{1}{2}$	85 $\frac{1}{2}$	80	85 $\frac{1}{2}$	80
May.	H.	87	87	86	82	87	82	82	82	81	84	84
	L.	82	83	85	79	80	79	80	80	79	80	80
	M.	84 $\frac{2}{3} \frac{5}{7}$	84 $\frac{1}{3} \frac{2}{7}$	84 $\frac{1}{2}$	80 $\frac{1}{2}$	83 $\frac{1}{2}$	80 $\frac{1}{2}$	83 $\frac{1}{2}$	83 $\frac{1}{2}$	82	83 $\frac{1}{2}$	82
June.	H.	86	87	89	82	87	82	82	82	81	82	82
	L.	84	81	77	77	77	77	77	77	76	77	77
	M.	85	84 $\frac{5}{3} \frac{6}{7}$	83	79 $\frac{1}{2}$	82	79 $\frac{1}{2}$	82	82	81	82	82

INTRODUCTION.

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T A B L E continued.

Months.	1784.	1785.	1786.	1793.		
				7 A. M.	1 P. M.	10 P.M.
July.	H.	87	86	88	81	88
	L.	82	84	76	77	77
	M.	84 $\frac{1}{2}$	84 $\frac{2}{3}\frac{1}{4}$	87 $\frac{7}{3}\frac{1}{4}$	79	82 $\frac{1}{2}$
August.	H.	88	88	87	82	89
	L.	84	78	78	78	80
	M.	85 $\frac{1}{2}$	80 $\frac{2}{3}\frac{5}{4}$	82 $\frac{2}{3}\frac{8}{9}$	80	84 $\frac{1}{2}$
Septemb.	H.	86	90	90	83	92
	L.	81	78	84	79	80
	M.	83 $\frac{1}{2}$	86 $\frac{4}{5}$	88 $\frac{1}{3}\frac{1}{4}$	81	86
Octoher.	H.	88	85	90	84	90
	L.	82	74	79	77	80
	M.	85	80	87 $\frac{2}{3}\frac{4}{9}$	80 $\frac{1}{2}$	85
Novemb.	H.	84	84	88	82	88
	L.	82	80	78	76	78
	M.	83	81 $\frac{1}{2}$	83 $\frac{2}{3}\frac{4}{9}$	79	83
Decemb.	H.	84	88	86	81	88
	L.	78	75	77	77	80
	M.	82 $\frac{6}{7}$	81 $\frac{1}{2}$	84 $\frac{2}{3}\frac{3}{4}$	79	84
						79 $\frac{1}{2}$

A TABLE of the WINDS.

Months.	1784.			1785.			1786.		
	Northerly.	Southerly.	Easterly.	Westerly.	Northerly.	Southerly.	Easterly.	Westerly.	Northerly.
Jan.	8		2		31				25
Feb.	19	10			26		2	28	
Mar.	19	8	4		16		4	11	14
Apr.	3	18	9		3		27		10
May		23	7		6		22		25
June	17		14		1		29		15
July	11	12	8				28	2	8
Aug.	27	4					15	6	28
Sept.			30		6	7	11	6	14
Oct.	11	10	10		12	2		17	1
Nov.	30				30				10
Dec.	28			3	10	20			11
Tot.	173	85	84	3	141	29	136	44	127
									115
									93 28

From the foregoing Table of the Winds it appears, that, taking the average of three years, the Northerly are to the Southerly and Easterly, as about 1 to 2; and to the Westerly, as about 1 to 7. And from the foregoing Table of the Height of the Mercury, it appears that the average heat of four years at Noon, is exactly 84 degrees.

Grenada, June 1. 1794.

A N

E S S A Y,

O N T H E

MALIGNANT PESTILENTIAL FEVER,

&c. &c.

THE state of the atmosphere between the tropics, does not seem to admit of the generation of a high degree of contagion ; and wherever such exists, it must arise from the most unpardonable neglect of cleanliness, and the retention of contagious effluvia from a total want of ventilation. The heat and consequent rarefaction of the air in hot climates, where due attention is paid to cleanliness and ventilation, must prevent infection ; and it is probable, that it is only where there is not a sufficient number of people to render, by their exertions, the places they inhabit, clean and sweet, that infection takes place and is retained. The observation made by Dr.

Blane

Blane on this subject, is, in many respects, just; and may be confirmed by that of every intelligent practitioner in this country. He says, "there is reason to think that the open air very soon dissipates, and renders inert all infections of the volatile kind; and of course, the warmer the air is, the more readily it will have this effect. It is accordingly observed, that infection is much less apt to be generated about the persons of men, and that it adheres to them for a much less space of time in a hot climate than in a cold or temperate one."¹ If infection, or rather the contagion arising from accumulated human effluvia, is produced only in situations wherein many are crowded together in a comparatively small space, it becomes a question of no small importance, why malignant and infectious fevers are never, or very seldom, generated on board slave-ships. In these the number is much greater than transports, or ships hired for the purpose of emigration, ever contain: the slaves, in order to prevent insurrection, are generally kept below, sometimes

¹ Observations on the Diseases of Seamen, p. 277.

times in irons, particularly during the night: the smell between decks is intolerably offensive to those not accustomed to it. Infection, however, is prevented, where so many causes combine to produce it, by the following means: The crew of a slave-ship is generally very numerous; whereby the risk, should insurrection happen, is much lessened, and the attention to the slaves is proportionally increased: the space between decks is regularly washed every day, if the weather permits: the slaves are, in parties of thirty or forty, taken on deck in fine weather, their irons taken off, and they are encouraged, by every possible means, to exercise themselves by dancing: they have no cloathing to which infectious particles can adhere: their persons are frequently washed: their diet is always composed of vegetables, without any mixture of animal food, and seasoned highly with capsicum: their drink is water: and scuttles are cut in the sides of the ship, by means of which, and windsails when they can be used, there is kept up a constant change of air, and as free a ventilation as the situation can admit of. But in every situation wherein the ge-

neration of infection is possible, the prevention of it is proportional to the degree of interest of those who have the direction and command. In ships of war, in merchant ships, in transports, and in ships hired for emigration, the interest of those who command extends not beyond the operation of a sense of duty ; of course we find it generally weak : it is rare, indeed, to meet an instance of the contrary ; but where we do, the effect is conspicuous. In slave-ships, the profits of the captain and surgeon are more or less, according to the number brought to market and actually sold ; hence their interest in their welfare is great, and their exertions to maintain it are proportional. It is disgraceful that “quærenda pecunia primum, virtus post “nummos,” should be in all ages the prevailing maxim of mankind.

In ships therefore in which the captains are not urged to prevent infection by motives of interest, fevers of a malignant and pestilential nature may be generated, even in hot climates. A ship of this description introduced the very fatal fever which raged in

in the port and town of St. George, during several months of the year 1793. The circumstances of this ship are in many respects singular. The following account I was favoured with by a gentleman,² who was one of the adventurers in the Boullam Scheme, and who, despairing of success, left the coast of Africa in this ship.

The Hankey sailed from England, in company with another ship, both chartered by the Sierra Leona company, loaded with stores and adventurers for the projected colony at Boullam, about the beginning of the month of April, 1792. When these ships sailed, and during the voyage out, the crews and settlers were all healthy; and as the latter were in general of the middling class of people, and appeared to be induced to settle in this new country, more from the delusive prospect of wealth held out to them, and the fanatic enthusiasm for the Abolition of the Slave Trade of the moment, than by any deprivation of the means of subsistence in their own country, no suspicion

² Mr. J. Paiba.

picion whatever can be entertained of the existence of latent infection among them; nor can marsh effluvia be supposed as the origin of the disease which afterwards swept off so many of those unhappy people. Boul-lam being surrounded by the sea, enjoys all the advantages of the sea-breeze; and being dry, and not incommoded by any marshy tracts, it is considered as the healthiest spot on the windward coast.³ It is

³ This part of Africa is allowed, by all who have visited it, to be uncommonly healthy and pleasant. I have conversed with several intelligent captains of slave-ships, who have uniformly agreed in this point: and indeed the appearance of the slaves brought from the windward coast, part of which this is, constitutes a convincing proof of the salubrity of the climate. Many travellers have given their testimony to this effect: the Chevalier de Marchais, in particular, is very full of its praise: "Le lit de cette riviere (Sierra Leonna) renferme quantité d'isles d'un terrain parfaitement bon, gras et profond qui produit de lui-même et presque sans culture tout ce-qui est nécessaire à la vie—Mais ce qu'on ne sçauroit estimer assez, c'est que l'air y est très pur, et qu'on n'y est point sujet à ces maladies violentes et dangereuses qui regnent à la Coté de Guinée et qui ont fait perir tant d'Européens. See Voyage du Chev. Des Marchais en Guinée et isles voisines, par le R. Pere Labat. tom. I. p. 58.—Dr. Lind also speaks favourably of these islands, and the adjoining

is not inhabited, but occasionally visited by the natives of the adjoining continent, who have small scattered patches of millet on it. It is, however, destitute of fresh water; and that, procured by digging temporary wells on the beach, is brackish, and consequently unwholesome. The negroes of this part of Africa are ferocious in an extraordinary degree; and are even said to be cannibals. This circumstance preventing the erection of any sort of accommodation on shore, during the nine months the Hankey lay there, the settlers were obliged to live on board; and the rainy season coming on almost immediately after their arrival, and the heat being at the same time excessively great, they endeavoured to shelter themselves from both, by raising the sides of the ship several feet, and covering her with a wooden roof.

Among

adjoining continent. *Diseases of Hot Climates*, p. 56. Capt. Norris, in his African Pilot, lately published, the most correct thing of the kind I ever saw, lays down Boullam in lat. N. 11; and long. W. from Farro, 3; almost in the mouth of Rio Grande, having Hen Island between it and the ocean. It appears to be nearly circular, about 15 miles long, and 15 broad; and consequently about 45 round.

Among upwards of two hundred people, of whom women and children constituted a part, thus confined in a sultry, moist atmosphere, cleanliness could not be well attended to, however well-inclined the people themselves might be. These circumstances, joined to the depression of mind consequent upon their disappointment, must certainly be considered as the causes of the malignant fever which broke out among those unfortunate people, some time after their arrival at Boullam. And no doubt can be entertained, that neglecting to sweeten the ship, to ventilate her afterwards, and to ~~destroy~~ the clothes, bedding, &c. of those who died on board, was the sole cause of her retaining the seeds of infection when she arrived at this port. The following facts will serve to illustrate this: Capt. Coxe, finding the water at Boullam unwholesome, proceeded with his ship to Bissao, where there is a Portuguese settlement, for a supply. The ship was navigated by about twelve seamen, most of whom had not experienced sickness, and had been probably procured from Sierra Leone: at any rate they were then taken on board for the first time. Of these, before

before the return of the Hankey to Boullam, nine died ; and the remainder, with the captain, were reduced to a deplorable state. The time for which the Hankey was chartered being expired, Mr. Paiba, with his family, intended to return to England in her ; but as no seamen could be procured, they were obliged to proceed to sea, having on board the captain sick, and only the mate, Mr. Paiba, and two seamen to navigate the ship. With much difficulty they arrived at St. Jago, where they fortunately found the Charon and Scorpion ships of war. Capt. Dodd, of the former, humanely rendered them every service in his power ; and on leaving them, put two men of each ship on board the Hankey. With this aid they proceeded to the West-Indies ; a voyage to England being impracticable in their wretched state. On the third day after leaving St. Jago, the men they procured from the ships of war were seized with the fever, which had carried off three-fourths of those on board the Hankey at Boullam ; and having no assistance, two of the four died : the remaining two were put on shore here in the most wretched state possible.

Capt.

Capt. Dodd, on his arrival at Barbadoes from the coast of Africa, was ordered by Admiral Gardener to convoy the homeward-bound fleet of merchantmen. In the execution of his orders, he came to Grenada on the 27th of May, and hearing of the mischief which the Hankey had been the cause of, mentioned that several of the Charon's and Scorpion's people were sent on board the Hankey at St. Jago, to repair her rigging, &c. that from this circumstance, and the communication which his barge's crew had with that ship, the pestilence was brought on board both ships; and that of the Charon's crew thirty died; and of the Scorpion's about fifteen. The Hankey arrived at the Port of St. George on the 19th of February, in the most distressed situation; and for a few days lay in the Bay, but was afterwards brought into the Carenage.⁴

From

⁴ Our Lieut. Governor, Ninian Home, Esq. sometime after the disease became epidemic, informed me, that in consequence of the information he had received of the clothes, &c. of the victims of the fever at Boulbam being still on board the Hankey, he ordered Capt. Coxe to be brought before him and some gentlemen

From this period are we to date the commencement of a disease before, I believe, unknown in this country, and certainly unequalled in its destructive nature.

—*Nova pestis adest : cui nec virtute resisti,
Nec telis, armisve potest* ————— OVID.

The manner in which this disease was first communicated, and its subsequent progress, too clearly evinced its malignant and pestilential nature. A Capt. Remington, an intimate acquaintance of Capt. Coxe's,

O was

of the council, &c. He then acknowledged that all the effects of those who had died were then on board his ship ; and said, that he would not destroy them, unless he was indemnified for the loss he might sustain, should the heirs of the deceased call on him for those effects. Every argument was used to induce him to destroy the articles, but the only one which influences a man of this description, Indemnification ; and he of course carried the seminium of the disease to England when the Hankey sailed with a convoy in July. Mr. Hume was so impressed with the idea of the danger which Capt. Coxe's conduct might be productive of on the arrival of the ship in England, that he wrote to the Secretary of State, stating the danger. Proper notice of this representation was taken by Government ; for the Hankey, I understand, was obliged to perform quarantine.

was the first person who visited the Hankey, after her arrival in St. George's Bay. This person went on board of her in the evening after she anchored, and remained three days ; at the end of which time he left St. George's, and proceeded in a Drogher^s to Grenville Bay, where his ship, the Adventure, lay. He was seized with the malignant pestilential fever on the passage ; and the violence of the symptoms increased so rapidly, as, on the third day, to put an end to his existence. The crew of the Defiance of Blythe port, near Newcastle, were the next who suffered by visiting this ship : the mate, boatswain, and four sailors went on board the day after her arrival : the mate remained either on deck or in the cabin, but the rest went below, and staid all night there. All of them were immediately seized with the fever, and died in three days. The mate was also taken ill, but, probably from his having been less exposed to the virulence of the infection, he recovered. The crew of the ship Baillies, from the same imprudent civility or curiosity, were the next who

^s A coasting vessel.

who suffered. These communicated the infection to the ships nearest them ; and it gradually spread from those nearest the mouth of the Carenage, where the Hankey for some time lay, to those at the bottom of it ; not one escaping, in succession, whatever means the captains took to prevent it ; even the smell and smoke of coal-tar, which is uncommonly pungent and penetrating, had no effect as a preventive ; for the Hope of London, then careening, and having her bottom paid with this bitumen, received the infection as extensively as the others, although none of her crew died of it. In the short space of time from the beginning of March to the end of May, 200 of about 500 sailors, who manned the ships in the regular trade, died of this fever. If to these we add, those who suffered on board Guinea-ships, and other transient vessels, the number cannot fall short of 250 ; which is nearly one in three, or a third of all the sailors during about ten weeks in harbour. From the beginning of June till the middle of August, when the disease had nearly disappeared, the number of sailors was considerably diminished, by two fleets having failed

failed for Europe, but the mortality was proportionably great. Although so great a mortality naturally leads us to form a dreadful idea of the virulence of the contagion which gave rise to it, it must not remain unconsidered, that the predisposition of the class of men among whom it happened, was very great. The sailors were men from the age of fifteen to fifty; and the circumstances which appeared to predispose them more strongly than other men to the action of the contagion, were violent exercise in the sun; the immoderate use of undiluted new rum; bathing in a state of intoxication, and often when violently heated; sleeping on deck during the night. Other circumstances which did not depend so much on their own prudence, no doubt, contributed very much to give the disease so very fatal a tendency: the damp heat between decks; the excessive filth of most of the ships; and the uncleanly state of the persons and clothes of the men themselves.

About the middle of April the disease began to appear on shore. The first house it shewed itself in, was that of Messrs. Stowewood

wood and Co. situated close to the wharf; and the infection was evidently introduced by a negro-wench, who took in sailors clothes to wash. The whole of the family were successively afflicted with it; and by them communicated to all those with whom they had any intercourse. The difference of temperature, and free circulation of air; the temperament of the inhabitants, in general, less disposing them to be acted on by the contagion; the superior care and attention to cleanliness, rendered the fever infinitely milder when it appeared among the inhabitants. The manner, however, in which it spread in town, clearly evinced its contagious nature; for all who from friendship, business, or duty, communicated with the diseased, were themselves infected: and no instance occurred wherein the contagion could not be traced to its particular source. A few, who more sedulously avoided the houses where the infected actually were, escaped: but all the means which come under the general designation of Prophylactics, were, as may be readily conceived, totally inefficacious. Of these, the celebrated “Vinaigre de quatre Voleurs,”

Voleurs," or the Acetum Aromaticum of the Ed. Ph. was generally used, and always without success. Camphor, sewed into a small linen bag, and hung round the neck, was another of this tribe ; but equally ineffectual. It will not appear extraordinary, that the lower classes of men, and those more especially of loose and debauched manners, should be the most subject to this disease ; their greater exposition to the influence of infection, which their business as tradesmen rendered necessary, contributed also not a little. But the description of men by far the most obnoxious to this contagion, and who suffered most from it, were those lately arrived from Europe ; and of them, those who had never before been in a hot climate. In general, those possessed of tense fibres and sanguineous temperament, were the most readily infected ; and among whom the disease was most fatal. It is impossible to ascertain with precision the number of the infected among the inhabitants, and the proportion of the deaths to that, or to the general number of white males and females in St. George's ; but where certainty is not, conjecture, on good grounds,

may

may be admitted. We may therefore say, that the proportion which the deaths bore to the sick, might have been about one to five ; and the sick to the total number of white inhabitants, about one to about one and a half.

That part of the garrison quartered nearest to where the Hankey lay, were the first of this class of men who received the infection. A barrack, containing nearly one-half of the 45th regiment, was situated exactly to leeward of the Hankey, and distant from her about two hundred yards. It is not to be supposed, that this circumstance alone could be productive of a disease arising from contagion ; but it was so in a secondary manner, by exciting the curiosity of some of the officers. One of these visited the Hankey, and, with two or three soldiers who rowed his boat, remained on board some time. The consequence of this imprudence was fatal to himself almost immediately after ; and, in a little time, to many of the men : all the officers and men were successively seized with the disease ; but it proved fatal only to recruits who had lately

lately joined. The strength of the regiment at this time was 280, and of these 24 died; so that the proportion was one to something less than twelve. The smallness of this proportion arose from the mode of treatment; as will be shewn hereafter.

About the beginning of May, the disease made its appearance in the detachment of Royal Artillery: a circumstance rather extraordinary, as that corps were quartered in a situation far removed from the focus of infection. It was evidently produced, however, by the communication which the gunners, doing duty in Fort George, had with the 45th regiment; and the predisposition of the men to receive infection as far as that could be induced by excesses in drinking, and other irregularities, was by no means less than that of the sailors and soldiers of the 45th regiment. Of 84 people belonging to the ordnance department at that time, about 56 were seized with the disease before the first of July, and of these five died: a trifling mortality, considering the nature of the complaint. All these men, however, had been about three years in

in the country, and consequently suffered less from the disease, than about 27 recruits who joined the artillery in July. Of 26 of these unfortunate men who were infected, 21 died before the middle of August: a dreadful instance of its peculiar tendency to prove fatal to strangers to the climate.

About the first of June, the disease began to appear among the negroes of the estates in the neighbourhood of town; and the alarm this occasioned was in proportion to the interest of those concerned in the safety and welfare of the slaves; but our apprehensions were soon found groundless; for the disease did not spread much among them, nor was it marked with the fatality which attended it when it appeared among the whites. In the course of a month its progress was so trifling, that only about one in four was seized with it; and the proportion of its mortality was still more trifling, viz. one to 83. It is more than probable, that had not this disease been super-added to the cacoehymic complaint, called in this country Mal d'Estomac, in the two

cases which terminated fatally, there would have been no mortality at all occasioned by it.

About the middle of June, the disease broke out in the 67th regiment ; and among the artificers and labourers on Richmond-hill. The infection was communicated by some of the latter, who had visited their friends in town labouring under it. All were successively seized with it ; but it fell heavier on the officers than the men, several of the former being young men lately arrived from Europe. The proportion of deaths was about one to fifteen.

The disease in the course of the months of May, June, and July, appeared in several distinct and distant parts of the country, whither the infection was carried by persons who had imprudently visited infected houses in town.

But the infection was not confined to Grenada alone ; from this, as a focus, it spread to the other islands, to Jamaica, St. Domingo, and Philadelphia, by means of vessels

vessels on board of which the infection was retained by the clothes, more especially the woollen jackets of the deceased sailors.

I have been thus particular in stating the progress of this malignant pestilential fever, chiefly with a view to demonstrate, 1st, That it was uncommonly infectious. 2d, That it arose from human contagion, heightened by various causes to a pestilential degree of violence. And 3d, That, like the plague, it has been communicated, in every instance, either by actual contact with an infected person ; or, by breathing air charged with effluvia perspired or discharged from the lungs of an infected person ; or by touching the clothes of or sleeping in a place where an infected person had been.

It is curious, and may be useful, to observe the gradation of this fatal malady, with respect to the various descriptions of people exposed to its infection. Neither age nor sex were exempted from its attack ; but some were more obnoxious to it than others ; and the colour had evidently much influence in determining its violence. The scale of its

its violence, or the gradation it observed with respect to the different classes of the inhabitants, appeared to be the following:

1. Sailors, more especially the robust and young; those least accustomed to the climate; and those most given to drinking new rum.
2. Soldiers, more especially recruits lately from Europe; and the most intemperate.
3. White males in general lately arrived; more especially young men from Europe.
4. All other white males, more especially the lower classes; and of them the most intemperate; those debilitated by recent sickness.
5. White females, more especially those connected with the shipping; and those lately from Europe.
6. People of colour, from Mustees to Cabres.
7. Negro-

7. Negro-men, more especially sailors
and porters.

8. Negro-women, more especially house-
wenches.

9. Children, more especially those of
colour.

The following Table will shew at one view the prevalence of the Malignant Pestilential Fever; and the proportion of its mortality in the town, garrison, and neighbourhood of St. George, from March to the end of August, :793, when it entirely disappeared.

Descrip-

Description of People.		Of the general Number Sick.	Of the Sick died.
Sailors	-	-	3
45th Regiment	-	-	12
67th Regiment	-	-	15
Royal Artillery	-	-	3
White Inhabitants	-	-	5
People of Colour and Negroes ⁶	-	4	83
General Proportion	-	$1\frac{3}{4}$	20

⁶ This calculation of the proportion of sick and mortality among the Negroes, arises from the following detail. The following estates were those only on which the Disease appeared: Point Maurice, or Molenier's, had a gang of 160; Grand-Mal, 179; Tempé, 147; Haut-Brion, 114. In all 600. Of these 165 had the Malignant Pestilential Fever, consequently the proportion of sick was nearly as 1 to 4; and of deaths, as only two died on Tempé, as 1 to about 83.

It had been urged by some, that the disease arose from the state of the atmosphere ; and that human contagion could not give rise to it, as it was so prevalent in distant and distinct places at the same time. That this opinion was without foundation, must evidently appear from the foregoing narrative : but had there been no other proofs of its contagious nature, the state of the weather alone during the months of February, March, April, May, June, July, and August, will be sufficient to shew that the temperature of the air could not produce an epidemic of so uncommon a character. The weather, though previous to the appearance of this disease much more wet and boisterous than is usual at that season of the year, was, after it broke out, mild ; and would rather have tended to check than promote infection, if that had been of a nature to be affected by such an agent. The two first months of the year were almost constantly rainy. The latter part of March, all April, and the first fifteen days of May, were dry, with the wind generally at east. The thermometer never rose higher than 87, nor fell lower than 85. Almost all the remainder

mainder of May was rainy, with sometimes thunder and lightning. In June the quantity of rain was much greater. As the change to moisture was remarkably sudden and great, much expectation was formed that the virulence of the infection would be done away, or considerably abated ; but as neither happened, the strongest possible argument was afforded against the agency of the weather in the production of the disease. In June the thermometer, more than once, fell to 77 at noon ; and rose once as high as 88. All July was rainy also, with boisterous wind from N. E. and much thunder and lightning ; thermometer highest 88, lowest 77. In August less rain fell ; but the atmosphere was generally close and sultry ; wind variable, but chiefly S. and W. Thermometer highest 89, lowest 80.

The subjects of this disease may be divided into three classes ; but differing from each other only in the degree of violence of the symptoms ; and from the scale or gradation already given, it will readily appear that the three first descriptions of men constitute

stitute the first class; the 4th and 5th the second; and the 6th, 7th, 8th, and 9th the third. To avoid repetition, I shall first describe it as it appeared in those seized with it in its most violent and fatal form; and afterwards treat more particularly of its most remarkable symptoms.

The patient, without any previous complaint, suddenly becomes giddy; he loses his eye-sight; every thing seems to move round him with inconceivable velocity; he falls down almost insensible, and in that state remains half an hour or upwards. During this paroxysm the body feels cold, and is overspread with cold sweat, which issues from every pore in astonishing abundance. On his recovery, the cold goes off, and is instantly succeeded by intense heat, and quick, small, hard pulse; the head aches dreadfully, particularly the forehead and sinciput, which is generally accompanied with pain in the right side, and at the præcordia. The last, however, has never been acute, and may rather be called oppression than pain. The eyes are much inflamed, watery, protruded, and wildly rolling; the

face much flushed; much heat is felt at the pit of the stomach; and that organ seems to be considerably affected by the nausea and frequent retching and vomiting, which then come on. The patient soon after complains of intolerable pain in the small of his back, and in the calves of his legs; but the last appears to be the most violent, During twelve, eighteen, twenty-four, or thirty-six hours, these symptoms continue increasing, except the quickness and hardness of the pulse, which do not change materially during that time, and are then succeeded by general coldness, cold sweat, a greater or less degree of coma and delirium, or a state very much resembling intoxication. Life in this state is lengthened out to sixty or ninety hours from the first attack. A short interval of reason then takes place; the patient considers himself better, and is for a moment flattered with the prospect of recovery; but a fit as sudden and unexpected as the first comes on, during which he foams at the mouth, rolls his eyes dreadfully, and throws out and pulls back his extremities in violent and quick alternate succession. In general the patient

patient expires in this fit ; but some have recovered from it, and continued rational for a few hours longer, when a second fit has carried them off. This has been the general progress of the disease in its worst form ; and indeed there have not been many deviations from it ; the principal of these were, the general symptoms coming on without any preceding convulsion. The patient has been, in some instances, comatose from the very commencement of the disease ; others have had the disease ushered in by a frequent succession of short convulsive fits, and it has afterwards been marked with constant delirium and cold clammy sweat, without any intervening heat of surface, &c. The disease too, in a few cases, has seized the patient in the manner most other fevers come on ; that is, with shivering and a sense of cold. The most constant symptoms, and consequently those which distinguished the disease, were the uncommon suddenness of its attack ; the remarkably acute pain in the loins and calves of the legs : the watery, inflamed, and rolling eye ; the flushing of the face ; the tendency to coma from the very onset ;
the

the peculiarity of the delirium attending ; and the pain confined to the forehead seldom extending to the temples, or even to the sinciput. However mild cases might be in other respects, these were always present. In no disease I have ever met with, is the physician more liable to be deceived ; for often when every symptom, indicating danger, has been apparently removed ; when the skin has become cool, the pulse seemingly natural, and the stomach so retentive as to receive a large quantity of bark, convulsions suddenly seize the patient and soon deprive him of life ; or delirium and cold clammy sweats supersede the favourable appearances, and forerun dissolution. How applicable therefore is M. Tissot's comparison of the malignant fever to a dog who bites without barking, to this insidious disease before us : “ L'on appelle fievres malignes, celles dans lesquelles, le danger est plus grand, que les symptomes ne sont effrayants. Elles sont du mal sans paroître dangereuses ; c'est, comme on l'a fort bien dit, un chien qui mord sans aboyer.”⁷

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⁷ Avis au Peuple, ch. 17.

The delirium attending this fever is of a peculiar cast. During it, the countenance, the eyes, and the actions of the patient resemble very much those of a person inebriated. It is almost always mild, and never furious; but is accompanied constantly with restlessness, and efforts to get out of bed. In a few instances these rose so high, as to render the attempts of the assistants of no avail; the patients dressed themselves, went out, and walked a considerable way before they could be overpowered. The mind seems agitated by the objects which were most its pursuit during health. An engineer, in his delirium, is continually employed in giving directions to the inferior officers, advising with them, and superintending the labour of the workmen. A man much involved in debt, is incessantly arranging with his creditors. A soldier talks of the duty he is employed in, and ever and anon expresses his fear of the officer's displeasure. A sailor, in the same manner, is solely engaged in maritime affairs. Scenes of former pleasure are eagerly recalled, and presented to the imagination in their most alluring circumstances; and if a

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momentary interval of reason takes place, the most piercing lamentations are the consequence. But in all cases of delirium, whatever the subject may be which the patient raves about, he is evidently and strongly actuated by fear ; and a word from the physician immediately reduces him to the most implicit obedience, however restless he might have been before. No pain is complained of during this state ; the irritation of blisters has no effect in rousing the patient ; and the operation of medicines that prove laxative, though not administered with that intention, passes without observation, and without sensibility. The patient, on being questioned respecting his situation, seems to recognize the person who speaks ; but never complains of any thing ; his answer being constantly that he is very well. Indeed, during the low state of the fever, whether delirium is present or not, the sensations of the patient seem exceedingly imperfect ; and instead of referring to any symptom which the bystanders perceive evidently, his answer invariably is, that he is very well ; and sensible of no pain. During delirium, the patient's lips are in con-

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tinual motion; he is continually muttering, and he is continually attempting to reach to some object which his deranged imagination presents to him. The strength, during the delirious state, appears to be surprisingly great, for it is frequently necessary to use the united efforts of two or three men to keep the patient in bed. This is however no more than a spasmodic affection of the muscles, for in reality the powers of the sick in this disease are reduced to the extreme of debility, as is seen in the convalescent state. The delirium comes on generally at the commencement of the low state, but is frequently present during the whole of the disease.

Coma is the next most remarkable symptom in this fever. After the first two days there is always more or less tendency to it; but after the third day, if the patient survives it, it has been in almost every instance, present. He appears drowsy, and is insensible of pain, or irritation of any kind; he moans and sighs much, but is immovable, unless called on. He generally lies on his back, with his eyes half open, the balls

balls of which do not appear to be capable of motion: if there is any it is extremely languid; their lustre is also much diminished. For some time I could not account for the supervention of this state at a certain stage of the disease: anxious to discover whether it depended on any peculiar affection of the sensorium, I examined the brain of two men who died on the fifth day. These patients, after the symptoms strictly febrile had abated, became comatose; in which state they continued till a convulsion put a period to their existence on the fifth day. In the first I examined the upper part of the cranium, on being sawed and prized up by a chissel, was so pressed from inwards by the swelling of the cerebrum as to fly off, or separate in such a manner as if a spring from within acted on it. On cutting into the cerebrum, the quantity of serous fluid was surprisingly great; but as the greatest part was lost, it was impossible to ascertain it. In the brain of the second, the quantity of water was also considerable. After observing these appearances, I was led to examine more attentively the state of the eyes
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of my patients in this disease ; and I have not the smallest hesitation in declaring, that in all those who became comatose, there was a very considerable and permanent dilatation of the pupils : an appearance which left no room to doubt respecting the state of the brain, and the nature of the symptom it gave rise to. I believe this appearance has not been noticed by writers on this subject. Of those at present in my possession, M. Poissonier Desperrieres alone mentions something similar—“ quelquefois la surdite survient, et quelquefois aussi une goutte sereine.”⁸

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⁸ *Traité sur les Maladies des gens de Mer.* tom. I.
p. 290.

Dr. Rush informs us, that a dilatation of the pupils was a very general symptom of the malignant pestilential fever, as it appeared in Philadelphia.—“ For a while I ascribed this peculiarity in the pulse (a small intermitting, slow, and tense, or chorded pulse) more especially its *slowness*, to an affection of the brain only, and suspected that it was produced by what I have taken the liberty elsewhere to call the *phrenicula*, or inflammatory state of the internal dropsy of the brain ; and which I have remarked to be an occasional symptom and consequence of remitting fever. I was the more disposed to adopt this opinion, from perceiving this slow and inter-

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The appearance which marked the character of the fever most unequivocally, was a species of efflorescence, which is said to be peculiar to malignant and pestilential fevers: this efflorescence resembled more patches of red or livid spots, than what is generally understood by the word Petechiæ; and appeared sometimes at the commencement of the low or comatose state; but oftener a few hours before death. It was a very fatal symptom; for I do not recollect a single instance of recovery when it took place. The neck, shoulders, and breast were generally the parts of the body the eruption broke out on; but in a few very violent

mitting pulse more frequently in children than in adults. Impressed with this idea, I requested Mr. Coxe, one of my pupils, to assist me in examining the state of the eye. For two days we discovered no change in it; but on the third day, after we began to inspect the eyes, we both perceived a preternatural dilatation of the pupils in different patients; and we seldom afterwards saw an eye in which it was absent." *An Account of the Bilious Remitting Yellow Fever*, p. 42. The Dr. most judiciously laid much stress on this affection of the brain, in forming his indications of cure; and he declares that the mortality would have been infinitely less in his practice, had he earlier observed this symptom, and applied the appropriate remedy. *Ibid.* p. 288

lent cases, almost the whole body has become of a deep livid or black colour three hours before death. In one instance, a young woman just arrived from England, petechiæ evidently appeared on her neck, breast, and arms; and it was the only one in which I perceived any thing of the kind; they constituted as fatal a sign as the vibices, for the patient died soon after their eruption, on the third day of the fever. These patches are well defined by Tissot, by comparing them to the wales or marks which remain after a severe drubbing. “*La peau se couvre souvent de taches petecheales (ce sont de petites taches d'un livide rouge) sur-tout au col, autour des epaules, au dos; d'autres fois ce sont de grandes taches brunes, telles que des meurtrissures de coups.*”⁹

The pains complained of in this fever, particularly those of the head and legs, are in many respects peculiar to it. The former is confined to the forehead, and shoots inwardly towards the bottom of the orbits, where

where it is generally exquisite ; it also sometimes extends to the temples, where indeed there is always a throbbing. In no case has pain been felt in the occiput, or generally throughout the head. The albuginea of the eyes is always much inflamed at the same time ; the balls are generally protruded, or seem ready to start from their orbits ; and the patient is sensible of a pain in them, which renders the admission of light intolerable. It has sometimes happened that the right eye has been most considerably affected ; and when this has been the case, the pain has been most felt in the right side of the head. The pain in the legs has been always felt immediately below the calf, where the gastrocnemii and soleus muscles unite and form the great tendon. A considerable involuntary contraction of the leg takes place in consequence of it ; and in the point where it is chiefly felt, it communicates a sensation similar to gnawing, which from time to time occasions extreme torture. Upon the whole, this pain resembles very much the cramp ; with this difference only, that it is, during the continuance of the fever, more permanent.

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I have already observed, that at the commencement of this fever the pulse is quick, hard, and small; and it is always so in the more violent cases. It is often, however, very full at this period; and when it is so, it affords a favourable prognostic. But in no disease is the state of the pulse more subject to variation than in this before us. It has frequently happened, and more especially with the robust, that during the stage immediately succeeding the febrile one, flushing and chilliness have oftentimes alternated in less than a minute; and that although the skin felt considerably warm, the pulse has been no more than 52; but that, even when the low state came on, in which there is always a disagreeable coldness of the surface, it has been as quick and nearly as full as during the preceding febrile stage, although unaccompanied with thirst, or any other evident symptom of the existence of fever. One remarkable circumstance of the pulse in this disease is, that it never intermits; even at the approach of death it has not intermitted; but has been generally remarkably tremulous, and so slow, as to beat no more than thirty times

times in a minute. Upon the whole, I have never found it quicker than 130, nor slower than 30, in a minute.

Subsultus tendinum is by no means a common symptom in the advanced stage; but tremor of the hands and of the lips, and violent spasmodic contraction of the legs and arms are very common, and always prognosticate much danger.

The appearance of the tongue is very various; in some patients continuing white with florid edges to the very last; in others, becoming dark-coloured very early, and changing to black a little before death; but in general, the change of colour of the fur with which the tongue, teeth, and even the fauces are covered, is gradual. Thus, during the two first days it is a white or clayey; it afterwards becomes buffy; then of a deep orange; about the fifth day, brownish; and when the case terminates in death, black. The thickness of the fur increases with the disease, and seems latterly to impede much the speech of the patient. The edges of the tongue are generally florid, exactly refem-

resembling its appearance in chronic aphthæ. I have not unfrequently seen the tongue have the appearance of having been exposed to soot, and covered with it: a singular circumstance, and mentioned by no writer I am acquainted with, except M. Tissot. “*Quelquefois cependant elle ressemble exactement à une langue qui auroit été long-temps exposée à la fumée.*”¹⁰

Aphthæ sometimes occurred; and, I think, were generally a bad symptom. Those I have seen were always of the white kind, resembling curd, and have been accompanied with a thick fur of the same consistency and colour on the teeth and gums. This symptom has been mentioned by Huxham and Poislonnier; the former of whom says, “but of much more uncertain and dangerous event are the brown dark-coloured aphthæ; nor are those that are exceeding white, and thick like lard, of a more promising aspect.”

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There were two kinds of eruption about the lips, of a very opposite nature ; one such as frequently appears at the termination of common remittents, and indicating a favourable change ; the other, consisting of black spots or specks, such as might be made by the point of a painter's fine pencil, all round the mouth, but especially the upper lip, and near the edge of the prolabium ; and indicating with certainty a fatal termination. The first generally appeared about the fifth day ; the latter about the beginning of the third, or towards the end of the fourth day.

Hæmorrhage has occurred in this disease much oftener and more profusely, and has been attended with more dangerous consequences than in any other, the scurvy perhaps excepted, that I have met with. In several instances, the immensity of blood discharged has evidently been the more immediate cause of death. The robust, plethoric, and gross habits have been the most subject to it. It has taken place from the nostrils, mouth, anus, and urethra ; sometimes from the canthi of the eyes ; but

never

never, I believe, from the ears or pores of the skin. The most profuse discharge has been from the nostrils and anus, and has frequently amounted to three or four pounds at a time; the stools having been on these occasions entirely composed of pure blood. Towards the close of life, the blood thus discharged has appeared granulous, or like ichor, with a sediment of a black gritty substance; and has been so extremely offensive as to oblige all the attendants to keep at a considerable distance till the hæmorrhage ceased. Hæmorrhage, however, has never been critical, nor has it in any instance permanently relieved the headach or pain in the breast or side. I have sometimes been induced to think, that it had benefited the patient, by his declaring that the headach had abated in consequence of it; but cold clammy sweats, an almost imperceptible pulse, and delirium or coma supervening soon after, evinced the imperfect state of the patient's feelings, and the fallacy of the prognostic.

Nearly about the period these profuse discharges of blood came on, a rawness was felt

felt on the whole of the interior surface of the nose ; and on several parts of it, little ulcers formed ; on others, small escars, which were remarkably itchy ; but on being touched, or an attempt made by the patient to detach them from the membrane of the nose, were very painful, and bled. These disappeared in proportion to the patient's recovery ; and I had much reason to suspect that when the issue of the disease was fatal, these little escars became gangrenous.

About the same time another symptom appeared in many instances ; which, were it not for its singularity, might be considered as too minute to be mentioned among those which distinguished the disease. Its singularity arises chiefly from the silence of modern writers on the malignant hospital or jail fever, with respect to it ; and from its appearing to be critical in the present instance.¹¹ About the end of the second day,

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¹¹ Dr. Donald Monro mentions the occurrence of a swelling and subsequent suppuration of the testicles in the malignant fever. *Diseases of the Army*, 1st. Ed. p. 44. M. Feissonnier says only, " il se fait bientôt des ecorchures dans certaines parties de leur corps, et la gan-

the patient begins to complain of a violent pain in his testicles ; on questioning him, he
says

gangréne s'en empare malgré toutes les précautions qu'on lui oppose." tom. I. p. 291. I think something of this kind is mentioned by Thucydides, in his celebrated account of the Plague of Athens ; but as I have not the original, I cannot speak with certainty. In Dr. Clifton's translation of this part of Thucydides's history, there is the following passage : " For the disease went through the whole body, beginning first in the head ; and, if any escaped, where the case was very desperate, this was denoted by the extremities being affected ; for it broke out *upon the private parts*, the fingers, and toes," &c. *Clifton's Translation of Hippocrates upon Air, Water, and Situation, &c.* Ed. 1739, p. 97. Hippocrates in several places mentions an affection of the scrotum and testicles in malignant and pestilential fevers. Does this afford a collateral proof of the pestilential nature of the disease before us ? A remarkable case of this kind occurred in the month of May, 1794. Mr. O'Hara, an officer of his Majesty's 56th regiment, uncommonly robust, and aged about twenty, having been seized with all the usual symptoms in the more violent degree of the Boullam Fever, as it was then distinguished, had on the 4th day a very large discharge of purulent matter from the urethra, attended with very considerable swelling of the scrotum. The discharge continued to increase all the 5th ; and I began to form a favourable prognostic from it. On the 6th, however, it became ichorous ; the penis swelled to a monstrous size, as did the scrotum ; and both began to change to a black

says he feels a contraction of the spermatic chord, and is sensible of a drawing up of the testicles towards the abdominal ring. On examination they appear very much lessened in size, are drawn up considerably towards the abdomen ; and the scrotum appears at the same time remarkably flaccid and empty. The surface of the scrotum becomes soon after very painful, and an excoriation takes place, chiefly at the most descending part, from which a considerable quantity of very offensive purulent matter issues : at the same time a similar discharge from the urethra takes place ; which ceases with the disease when the event is favourable, or becomes ichorous or bloody, and insufferably foetid when death is the consequence. In cases which

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a black colour. These unfavourable appearances increased rapidly the 7th and 8th, and the discharge became then a putrid fancies, excessively offensive. On the day of his death, the 9th, the scrotum was fully nine inches in diameter, and the penis three ; and both were completely mortified and black. During the latter days of his illness, he lost a prodigious quantity of blood from the nose, mouth, ears, eyes, and even from the pores of his skin.

terminate favourably, the whole of the scrotum in a few days is covered with a coat of hardened pus, which, in the convalescent state, comes away very easily by means of a warm bath. The thickness of this coat may be about a fourth of a line, and when separated, resembles much moistened parchment. In fatal cases, this affection of the scrotum always terminates in gangrene a few hours before death.

The change of voice is very remarkable in this fever; for from a strong tenor or manly sound, it sinks to a treble, or a sound much softer, lower, and shriller than the natural one; the syllables are more distinguished, and the words are strangely lengthened out in a drawing or whining manner. In the patients who have sunk under this disease, the change of voice happens much earlier, and more remarkably than in others. It has therefore always afforded me a pretty certain prognostic of the event; for any alteration of the sound towards the natural one, is an almost certain sign of a favourable change.

A suppression of urine is by no means an uncommon symptom in the bilious remittents

teins of the country ; and, in general, it is a circumstance which often occurs in fevers of a synochus or typhus character ; but in the malignant pestilential fever, it is particularly remarkable for its coming on early, its duration, and the cause which seems to produce it. In the third volume of the Edinburgh Literary Essays, there is a very ingenious and useful paper on the affection of the urinary bladder, which Dr. Gilchrist, the author, has called a “ thickening of the bladder.” To this I might refer for a description of the state of the bladder occasioning urinary suppression in this fever; for on dissection it appears exactly similar. Here I shall only observe, that the suppression is accompanied by a violent pain above the os pubis ; a scalding in the urethra ; a sense of fullness, without any visible turgescence in the region of the pubes ; a considerable contraction and contortion of the penis ; and the urine is generally of a very deep red colour ; sometimes brownish ; sometimes green ; very frequently bloody ; and, in a few instances, much inclining to black, and of an oily consistence. The smell of the urine was generally offensive in the highest degree.

degree. Indeed, all the excretions were remarkably foetid; but the stools were more especially so. Constipation almost universally prevailed: a circumstance extremely unfavourable, as the means used to obviate it always increased the tendency to putrefaction, by bringing on debility proportioned to their effect. This appeared to arise from a suspension of tone in the intestinal canal; for on exciting the fibres to act, a redundant evacuation was generally the consequence. The fæces at the commencement of the disease were seldom very foetid; but, during its progress, became excessively so; and, a little before death, when they were discharged insensibly, the smell was intolerable. The colour and consistence of this discharge varied much; from yellow, or a yellowish white to black; and from a considerable degree of thickness, to the exact appearance of coffee-grounds. The discharge by vomiting, which became a most dangerous symptom at the commencement of the low state, also varied much; although for the most part poracious: but towards the fatal crisis, always black, and resembling coffee badly boiled.

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The thirst was not very considerable in general, and no very useful indication could be drawn from the state of it. It was, however, a bad sign when the thirst ceased, especially if at the same time the tongue appeared parched, cracked, and black.

A principal distinction between this disease and typhus icteroides, is the yellow suffusion, which in the former very seldom happened; in the latter almost always. But as this appearance can never be considered as a distinguishing symptom in any highly malignant fever, it frequently occurring where the other symptoms point out a disease differing essentially from that in which it most generally takes place, it will be sufficient to mention, that in some protracted cases on shore, and in some among the sailors which might have been a combination of the pestilential and yellow fevers, this symptom appeared about the 5th, 7th, or 9th day.

Most other diseases degenerated into, or partook very much of the nature of this. Dysenteries suddenly stopped, and were immediately succeeded by the symptoms of the pestilential

pestilential fever. A remarkable instance of this occurred in the month of July, 1793. About the beginning of the month, twenty-seven recruits joined the detachment of royal artillery in this island. These men formed part of the artillery, which, with other troops under the command of Major General Bruce, landed on the island of Martinique about the middle of June. During the three days they remained on shore, they were encamped, and almost the whole time exposed to very heavy rain. Dysenteries were the consequence; and most of them, on their arrival here, were immediately admitted into the royal artillery hospital; where at that time, as has been already observed, there were many cases of the pestilential fever. The apparent effect of the medicines they took very much surprised me; but I soon found that the original disease only yielded to one more powerful; for in a few hours after the symptoms of dysentery disappeared, those of the pestilential fever came on. Catarrhal complaints, simple at first, soon changed their nature: convalescents from other diseases were very subject to this, but it generally

proved mild. Those labouring at the time under chronic complaints, particularly rheumatism and hepatitis, were also very subject to it. The puerperal fever became malignant, and of course fatal; and even among pregnant negro-women, who otherwise might have had it in the usual mild degree peculiar to that description of people, were reduced to a very dangerous situation by it. In short, every disease, in which the patient was liable to infection, sooner or later assumed the appearance, and acquired the danger of the pestilential fever.

Although the contagion seemed to vary much in different descriptions of people, it is highly probable that the virus of the contagion itself was uniformly the same, only variously modified by peculiar constitutions, habits, or modes of living. Thus among sailors, perhaps a scorbutic taint, joined to extreme irregularity and imprudence, rendered the disease infinitely more fatal than among any other class of men. On the other hand, among field-negroes who certainly possess an idiosyncrasy peculiar to themselves, and whose mode of living is gene-

generally temperate and regular in a remarkable degree, the virus of the contagion was so blunted, as to act in the mildest form. Why, however, it should operate with most violence on Europeans just arrived, and who had never entered the torrid zone before, is a singularity I do not pretend to explain. The advice of Celsus is very applicable in the present instance, and may afford us a hint with respect to the cause of this singularity : “ *Si plenior aliquis, et speciosior, et coloratior factus est, suspecta habere sua bona debet.* ”¹² Every thing debilitating predisposed the body to be acted on by this contagion ; fear ; an hypochondriacal disposition ; inebriation ; fasting, or visiting the sick with an empty stomach ; great fatigue ; entering the chamber of the sick in full perspiration, &c. But whatever were the predisposing causes, the contagion always acted within four days from its application to the body. I am aware of the difficulty of ascertaining the time which contagion takes to act on the system after its admission into it ; but my situation

¹² Lib. II. cap. 2.

situation afforded me many opportunities of knowing it with sufficient exactness. In some instances, symptoms of its action have appeared in six hours; in others, in twenty hours; in others in forty-eight; and in others, not till the expiration of the fourth day; so that, in general, we may consider the space of time required for the production of disease consequent upon the application of the contagion, as about a trifle short of two days. For although all from whom I have received the information which has enabled me to make the above calculation, have been sensible of receiving the contagion, the instant it was applied, by nausea and slight rigor indicating it, yet those symptoms were only momentary. I do not know that this point has been much attended to; at least the writers I have been able to consult, seem silent on the subject. Dr. Guthrie of St. Petersburgh, from the information he received from the medical gentlemen of the Russian army, as well as from the event of the inoculation for the plague in one instance, seems inclined to fix the time of action of pestilential contagion, at the fourth day.

day.¹³ And as the diseases are not dissimilar, on the contrary, are much of the same nature, his authority may be considered as strongly corroborative of my observation. The importance of ascertaining this point with tolerable precision, is evident; prevention altogether depending on it.

Another point subject to much uncertainty, and a good deal agitated among physicians, is the distance at which it is possible to communicate the contagion. The result of my inquiries and observation on this subject amounts to the following facts:

1. That those who most carefully avoid houses where the infection is, are the most certain to escape it.
2. That although the disease is in the same house, avoiding the chamber of the sick, prevents infection.
3. That the merely entering the chamber of the sick, without nearly approaching the diseased person, has never communicated infection.
4. That approaching so near the diseased person as to be sensible of the fœtor of his breath; or of the peculiar smell
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which is always emitted from the bodies of the sick in this disease ; or to touch the bed-clothes he lies on, generally occasions nausea, slight rigors, and often headache at the moment, and some hours after the disease itself. 5. That actual contact, so that the perspired fluid of the sick person may adhere to the hands, &c. of the healthy person, more certainly produces this disease. 6. That touching the wearing apparel of a person who is actually diseased, or has just recovered from the disease, as certainly communicates the infection to the healthy person. And, 7. That frequently the merely passing a person infected, or who wears the clothes he had on during the existence of the disease, in such a manner as that the effluvia proceeding from them may be blown on the healthy person, has produced the disease. From hence it is evident, that the infectious effluvia do not extend themselves beyond a limited distance from the person or thing from which they are emitted ; and this distance may be fixed at the utmost at six or ten feet. Dr. Lind, however, thinks that " in the open free air, this infection does not appear to diffuse itself above fifty

sixty feet from its *nidus*; though even at that distance a person might run some risque from being exposed to a current of air highly impregnated with the contagion which immediately issued from a door or window, where it had been long pent up.¹⁴ Although this, during the time the malignant pestilential fever prevailed here, never, I believe, happened, both accounts may be reconciled, by allowing for the influence of heat in this climate, occasioning such a degree of rarefaction of the air as to prevent the diffusion of contagion beyond the atmosphere immediately surrounding the diseased or infected body, the radius of which may be estimated at six or ten feet. And Dr. Blane very justly observes, that “virulent matter is of such a degree of volatility as to be readily dissipated in a certain degree of heat.”¹⁵ But whatever the limits of infection may be with respect to its power of acting on healthy bodies, much must depend on the state of these bodies at the time they are exposed to the contagion.

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¹⁴ Dr. James Lind's Essays, Ed. 1774, p. 319.

¹⁵ Diseases of Seamen, p. 279.

The danger attending the opening of bodies in this disease, prevented me from extending my inquiries this way so far as I otherwise would have done. I opened only five, the appearances in which I shall here give an account of. Three of the five were sailors, who died on the fifth day, and laboured under the worst symptoms of the disease. In one of them it began and terminated with convulsive paroxysms. The intestines were much inflated, inflamed, and sphacelated, particularly the duodenum, a little beyond the pylorus ; the liver had shrunk to less than one-half its natural size, was uncommonly flaccid, and of a colour nearly approaching to buff ; or a mixture of yellow and that of ashes ; the gall-bladder was flaccid and greyish, and contained a small quantity of very dark-coloured, ropey bile. The spleen and pancreas were in a natural state ; but the lungs were highly inflamed, and of a livery texture and hue : a circumstance the more extraordinary, as no symptom of marked pulmonary affection could be perceived during the existence of the disease. The bladder contained near three quarts of urine ; and was dilated to considerably

derably above the os pubis ; and its coats were much thickened. This patient had been constantly tormented with pain, throughout the whole region of the pelvis, and almost a total suppression of urine.

The second was remarkably robust and athletic, and had been seized with the disease in the form of an aguish paroxysm ; but died strongly convulsed. The viscera were in general in the same state, particularly the liver. All the vessels of the intestines were uncommonly turgid ; the right kidney was mortified ; although, during his illness, no symptom of inflammation of that organ was perceived. The quantity of urine was small, although the suppression had been considerable ; and the bladder, a good deal enlarged, felt much like an elastic gum-syringe ; the coats very much thickened, but renitent.

The principal morbid appearances in the bodies of the third and fourth, I have already described. These two were the only subjects in which I examined the state of the brain. To what I have already said on

the dissection of these two bodies, I have only to add, that the viscera of the abdomen and thorax, were exactly in the same state as the others; and that one was a young man of the royal artillery, about 18 years of age, who arrived with his master, Capt. Irwin of that corps, about six weeks before; was remarkably florid, robust, and lively; and obstinately refused to avail himself of medical assistance during the whole of his illness. In the brain of this young man, the quantity of blood was surprisingly great; for, exclusive of what was lost in opening the cranium, fully two pounds were collected. In the left ventricle the quantity of water was also considerable; but there was none in the right. The fourth ventricle contained a larger quantity than ordinary; and the plexus choroides was almost obliterated. There was no polypous concretion in either of the ventricles of the heart.

In the fifth, a young man of the royal artillery, just arrived from England, who died in twenty-nine hours from the commencement of the fever, the appearance of
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the viscera was exactly the same. This man's fever abated considerably on the breaking out of a copious diaphoresis; his stomach was remarkably retentive, which enabled him to take at least two ounces of bark in a very few hours. As he was preparing to take a dose of this medicine, he felt a little uneasiness at his stomach, which induced him to defer it; but on laying his head on the pillow, he expired without a groan, or the least struggle.

Mr. White, mate to the 45th regiment, who at that time attended the hospital of the regiment, with much and deserved credit to himself, opened several bodies of soldiers who died of the malignant pestilential fever; and he in all remarked the same appearances I have above described. He did not examine the brain in any instance but from the symptoms, particularly the coma, delirium, and dilatation of the pupils, being exactly similar, little doubt can remain with respect to the state of it.

I may here observe, that the appearances in the bodies of twenty which were opened

at

at Brest, were almost exactly similar, that of the liver in particular, which M. Poissonnier says was livid, flaccid, and overspread with cineritious and blackish spots, under which were small drops of clotted and ill-conditioned blood—“ le foie de plusieurs se trouve livide, mollesse, et parfémé de taches cendrées et noirâtres, sous lesquelles on apercevoit des gouttellettes de sang grumelé et denaturée.”¹⁶

The only material difference which appears between the dissections described by Sir John Pringle, and those which were made here is, that in his there were abscesses in the brain; whereas in ours, a considerable quantity of serous fluid in one, and of serous fluid and blood in another, alone were found. But this difference, I apprehend, may be very readily accounted for by the very rapid progress of the disease in our cases, and the length of time to which those Sir John Pringle treated, were protracted. In ours, the disease terminated fatally in five days; in his, death did not happen

¹⁶ Tom. I. p. 334.

happen till the expiration of a fortnight or a month.¹⁷

From the circumstances of this disease related in the foregoing sheets, it will readily appear that the mode of termination could not with certainty be foretold by any one of them alone. The particular state of any of the excretions, unless the changes which took place in the other symptoms were at the same time attended to, could not afford any precise prognostic. In a word, it was only from attention to the general state of the patient, we could form any idea of what the event might be. It is a general observation, that in malignant fevers the critical periods are more distinctly marked than in any other; the disease before us affords an additional proof of this. I have not met with any disease in this climate, in which the periods were more distinctly ascertained. The disappearance of the disease, or the death of the patient,

always

¹⁷ Diseases of the Army, 7th ed. p. 301. It is singular that no mention is made, by this illustrious physician, of dilatation of the pupils of the eyes. Does this symptom distinguish the two diseases?

always happened on the odd days ; but the change in the state of the disease, which preceded either event, took place on even days. Thus, if the patient was worse on the evening of the second day, he would die on the third ; if worse on the fourth, he would die on the fifth ; and so on, as far as the fourteenth day. Beyond that period, I have not seen an instance of the disease ending fatally, although it has been protracted, in a few instances, to the 21st day. In the same manner, if the patient felt better, or if there was an evident abatement of the symptoms on the 2d, 4th, 6th, &c. days, the resolution of the disease would happen on the following days. But perhaps the subjoined Table of the state of the patients in the royal artillery hospital, who recovered, and died, will illustrate this point more fully than any other mode of explanation. I make choice of this in preference to any other part of my practice, because there my observations were necessarily more accurate ; and because few in private life enjoy the advantages which the sick of the royal artillery do ; arising from the very liberal manner in which their hospitals are fitted

fitted up, and supplied with the necessary servants, diet, wines, and medicines. This Table will also shew the result of my practice, in the four modes of treatment I adopted. I shall detail them when I come to treat of the cure.

A TABLE shewing the Number that Died, and the Number that Recovered, under the various Methods of Treatment.

MODES OF TREATMENT.	Died on the				Began to recover on the			
	29th H.	3d D.	5th D.	7th D.	9th D.	36th H. to 5th D.	7th D. to 9th D.	9th D. to 21st D.
Treatment with Mercury -	—	5	8	2	1	11	24	7
Treatment with Peruvian Bark	1	—	3	—	4	—	3	4
Russian Treatment -	—	1	—	1	—	—	1	1
Treatment with Angustura Bark	—	—	—	—	—	2	3	—
Total - -	1	6	11	3	5	13	31	12

The very uncommon malignity which marked this disease after its appearance, and during its progress here, and some of its symptoms resembling those of pestilence ; the manner too in which it was introduced, and afterwards propagated among the sailors, garrison, and inhabitants, will induce us to consider it as in no small degree partaking of the nature of true plague. It is generally agreed among writers, who have themselves seen and treated the disease in all its various forms, that the only symptoms, which can be with propriety considered as characteristic of the plague, are the buboes and carbuncles which appear about the critical period, and generally forerun a resolution of the disease ; but it has been at the same time allowed, that the plague does sometimes appear without buboes. Whether the disease in question may be classed among the pestilential or not, I leave to those to determine who have more leisure and fitter opportunities than I have. I shall only further observe on this head, that I have not seen carbuncles in any case which ended in death ; but that in many who recovered they were nume-

rous, large, and very troublesome. These occurred chiefly in the young and robust; and always about the period the dangerous symptoms disappeared; and indeed so exactly did the appearance of the carbuncles fall in with the favourable change in the disease, that I have always considered them as a critical discharge: the only thing of the kind, except the purulent discharge from the scrotum and urethra, I have been able to observe in this fever. Swellings on the parotids, and buboes in the groins and arm-pits also occurred in several cases; but these generally terminated in death.

When this disease first appeared here, and for some time after, the prevalent opinion was, that it was the yellow-fever of the West-Indies, engrafted on the European jail-fever. But it must appear from the foregoing account, that though it is evidently of the nature of jail-fever, heightened by some pestilential symptoms, it does not partake in the least of the typhus icteroides. The most obvious circumstances which distinguish the two diseases are the following: The nature of the delirium in
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the malignant pestilential fever is singular, and resembles that in the plague, being marked with the fatuity, silliness, and the stammering and faltering of the voice peculiar to that malady ; the delirium in yellow-fever is generally more of the wild, furious kind, and is never attended with the circumstances mentioned. The yellow-fever is endemic and sporadic; the other, epidemic, and imported from another country. The yellow-fever is always influenced by the weather ; and, indeed, depends altogether on the heat of climate ; the other, till of late, was thought to be peculiar to the temperate and cold climates. The one is evidently caused by marsh effluvia, heat, violent exercise in that heat ; thick, hot, moist atmosphere ; night air, and dews ; and the abuse of spirituous liquors. The other, on the contrary, is caused by contagion alone. This is certainly the most remarkable difference ; and constitutes an obvious, clear, and undisputable diagnosis. I have never in any instance, and I have seen many, of yellow-fever, known it to be contagious : it has always been evidently produced by the causes mentioned ; and other persons on board

board the said ship, or in the same house, have continued in perfect health. But what more positively demonstrates the difference between the two diseases is, that the yellow-fever has been known in the West Indies ever since the first establishment of the colonies ; the malignant pestilential fever never, I believe, till the year 1793. When the yellow-fever appeared at Barbadoes in 1721, Dr. Warren, who then practised there, was induced from its violence, and the seeming likeness of many of the symptoms, to call it a species of the plague imported from Marseilles' to Martinique, and from thence to Barbadoes. That it was not pestilential, however, is manifest from the united testimony of contemporary practitioners, and from the account given by Mr. Hughes, the Natural Historian of the colony at that period.¹⁸

Upon

¹⁸ The Rev. Mr. Griffith Hughes's *Natural History of Barbadoes*, folio ed. p. 37, 38. Dr. William Hillary, 2d ed. *On the Air and Diseases in Barbadoes*, p. 144, 145. M. Pouppé Desportes, in his description of the yellow-fever, corresponds exactly with the idea he gives of it in his Constitutions of the different Years : "On a ignoré pendant long-temps les funestes effets de cette

Upon the whole therefore, if we draw our conclusion with respect to the diagnostic of this disease, from the remote and proximate causes, from the symptoms, from the dissections, I apprehend, we must consider it as truly pestilential, and differing from the plague strictly so called, only, in not always exhibiting the symptoms that are said to be peculiar to that malady.

The sudden manner in which this fever attacked, in every case, rendered it impossible to administer any thing in the way of prevention. Had the sick, indeed, been always sensible of the infection the instant it was applied, no doubt much might have been done in this way; but unfortunately this

cette maladie dans les îles; la régularité avec laquelle elle se reproduit, semble devoir la faire regarder comme une de ces maladies dont il faut chercher la cause dans la constitution de l'air." *Histoire des Maladies de S. Domingue*, tom. I. p. 191. The attentive perusal of this writer's Constitutions of the Air at Cape François from 1732 to 1748, when he died, will give a much better idea of the causes and nature of the yellow-fever, or "Maladie de Siam," as he calls it, than all that has been written on the subject by others—to those who are not practically acquainted with it.

this happened in very few instances, comparatively speaking ; and when it did, none were willing to believe that any dangerous consequence would ensue. In the cure therefore of the disease, I was always obliged to begin at, or soon after its actual invasion ; but as the symptoms very seldom directed to a proper knowledge of its true nature ; and as the fatal termination often happened at a very early period, and unexpectedly, I found it a most difficult as well as painful task, for some time after the disease broke out, to form a plan of cure. Finding at length the total inefficacy of the usual method recommended in treating malignant fevers ; and becoming by constant observation on a multitude of cases, in its most violent form, better acquainted with the disease, I founded my plan on the following reasoning. It was evident, however indirectly marked by the symptoms, that the first stage of the fever was an inflammatory diathesis, peculiar in this respect, that its tendency to terminate in gangrene was infinitely greater than in any other disease I ever met with. It was no less evident that this stage was succeeded by one

one wherein nervous excitement and a putrefactive diathesis were equally remarkable, and equally tended with an uncommon rapidity to the dissolution of the patient. It was also evident, that these diatheses had an extraordinary aptitude to run into each other, without showing any distinct termination of the one, or accession of the other; and it appeared, that the imprudent use, or the anticipation of the means of obviating either of these states or diatheses, inevitably hastened the progress of the other to its peculiar termination. Having these facts before me, it was clear that if I at once went on the antiphlogistic plan, I would, with certainty, anticipate the fatal issue of the disease, by inducing an extreme degree of debility; and that, on the other hand, if I adopted at the commencement of my treatment, the antiseptic plan, I would inevitably increase the tendency of the existing inflammation to terminate in gangrene. Many proofs of both these fatal errors occurred daily for some time after the introduction of the disease; and surely the practitioner could not be blamed when it is considered that the disease was new, and unknown

unknown in the climate. From the foregoing data, the following indications naturally resulted, and always guided me in my future practice; for however varied the remedies might be, still these were the points to be gained :

1. To discharge from the stomach and intestines acrid and offensive humours.
2. To obviate inflammatory diathesis, without producing a tendency to putrefaction.
3. To moderate the tendency to putrefaction, and to obviate it when actually present.
4. To restore tone and energy to the system.

In the remittent fever of the country, and indeed in every disease in which there is a bilious accumulation in the primæ viæ, I have generally used a solution of the natron vitriolatum and tartarised antimony in water, in preference to any other evacuating

cuating medicine. It possesses this singular advantage of effecting three evacuations in a very short space of time; and although a powerful emetic, it by no means occasions any untoward irritability of stomach. In the present instance I had recourse to this excellent remedy, and gave it in the following manner: An ounce and an half of the salts, and two grains of the tartarised antimony, being dissolved in a pound and an half of pure cold water, a large wine-glassfull of the solution was given every hour to the patient, until a sufficient effect was produced, or till the whole of the quantity was taken. The two first glassfulls generally operated as an emetic, and fully evacuated the stomach; the medicine after this acted on the intestines, and excited a copious discharge of their contents. If, at the same time, a diaphoresis broke out (and it almost always did) the patient found himself considerably relieved. I have sometimes, however, dreading the consequence of copious evacuation by stool, contented myself with an emetic alone, composed of from ten to thirty grains of ipecacuanha, and one or two of the tartarised antimony; but any advantage derived from

this practice, did not compensate for the loss of time; for if a gentle purge was administered after the operation of the emetic, it took several hours to produce its effect: and if clysters were depended on, their action did not extend beyond the larger intestines. In several cases of the third class, and a very few of the second, in which my assistance was called for very early in the fever, I had the satisfaction of seeing a speedy and complete termination put to the complaint, by the solution. This, indeed, was doing what has been recommended by Sir John Pringle, preventing the disease, or rather carrying off its fomites before they can act generally on the system; but perhaps the means were better. When the disease first appeared among us, fear of anticipating the irritability of stomach, induced some practitioners, and myself before I became fully acquainted with the disease, to give at first a pill of solid opium, and after allowing an hour or two for its solution, to administer the evacuating medicine; but for the reasons already given, the impropriety of this practice must be obvious. As it is highly probable, from the manner

in which the contagion acted, that it was carried into the system chiefly by means of the stomach and intestines, the importance of administering a medicine which in the shortest space of time possible will evacuate them, at the same time that it tends to obviate any general febrile affection which may have taken place, must be evident. I have often derived considerable advantage from using the bitter purging-salts, instead of Glauber's, either in the same proportion, or a larger one; and I have rendered the solution much more palatable by the addition of lime-juice and sugar.

To fulfil the second indication was infinitely more difficult; and the danger of making an improper choice of the means, much greater. The fate indeed of the patient altogether depended on the judicious selection of means, in removing the inflammatory without producing a tendency to putrescent diathesis.

It has been very generally recommended to draw some blood before other means are used, at the beginning of malignant and pesti-

pestilential fevers. In the present instance, the ardent heat of the surface, the oppressed hard pulse, the pain of the side, the oppression at the præcordia, the headach, and the throbbing in the temples, seemed strongly to indicate the use of bleeding. Very little experience, however, was sufficient to shew the impropriety of it; and instructed by repeated examples of its hurtful effects, I very early laid aside all thoughts of lessening the inflammatory state by means of it. Although the blood, drawn in the cases wherein this remedy was employed, was remarkably florid, and always threw up an inflammatory crust of greater or less thickness; and although the pains seemed to undergo a temporary mitigation, yet the consequence at the expiration of a few hours was always fatal. I was the more surprised at this event, as the patients were remarkably robust, florid, and generally in the vigor of life.

Having thoroughly cleansed the primæ viæ, my next object was to encourage a diaphoresis, if it had already come on, which I have observed often happened in consequence

quence of the use of the evacuating medicine; or if it had not, to promote one. For this purpose, I made use of various means; such as the saline draughts of Rive-rius, with and without the addition of the æthereal spirit of nitre or vitriol; and I often preferred this addition, on account of the suppression of urine. In all cases, the symptoms of which did not run high, this was a most useful medicine; and although the taste was often complained of, it seldom deranged the stomach. With this I generally gave a powder every two hours, composed of nitre, camphor, and the pulvis antimonialis; and in order to give these medicines a greater tendency to act on the skin, a few drops of laudanum were occasionally added to the draught, or a small proportion of opium joined to the powder. Perseverance in this plan, in the less violent cases, was sometimes attended with complete success; for the pulse becoming flower and soft, the pains abating, and the skin being covered with an agreeable moisture, all that remained to complete the cure, was to prevent the tendency to putrescence by the liberal use of bark, wine, and nourishing food.

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This success, however, was confined to the third, and a very small part of the second class of patients. The more violent cases of the disease, in which the patients were hurried out of existence, wherein the whole frame was agitated by a conflict the most dreadful, demanded a treatment in which the most vigorous and speedy decision, the boldest perseverance in the adopted plan, and the closest attention and observation became absolutely necessary. In these cases local inflammation was more clearly indicated than in others ; but bleeding was, if possible, a more dangerous remedy here than in them. Finding all the antiphlogistics I had used totally ineffectual, and that bleeding was on no account admissible, I had recourse to the only remedy left me, mercury. I was encouraged to the practice by the appearances I observed in the two first bodies I opened. The liver was evidently the most diseased part, and I knew that mercury was specific in all inflammations of that organ ; besides, it was at all events better to try a doubtful one than remedies of no efficacy. I accordingly administered calomel either combined with nitre,

nitre, camphor, and the antimonial powder, or in the form of a pill. After many trials of both, I preferred the last, chiefly on account of the nitre and camphor disagreeing with the stomach. The pill was generally composed of five grains of calomel, two of the antimonial powder, and one of opium ; and repeated four times in the twelve hours, or eight in the twenty-four hours. I confess it was with no small degree of anxiety I ventured on this practice, unwarranted by any other authority than dissection and my own observation ; but its success justified my temerity. If salivation was speedily raised, the danger was removed, and the patient recovered. But in order to effect this, it was frequently necessary to increase the quantity and number of the doses ; and, in several instances, I have pushed it to an almost incredible length, with astonishing success. In one case in particular, a gunner of the royal artillery, named Thomas Smith, in whom signs of recovery did not appear till the twenty-first day, fully 400 grains were given before the salivary glands were affected.

For

For some time the question respecting the propriety and impropriety of this practice was much agitated among my fellow-practitioners. The principal arguments offered against it were founded on its novelty ; its militating against the received theory of the nature of malignant and pestilential fevers ; and on the very limited duration of the disease, which, it was said, did not admit the administration of a quantity large enough to excite salivation, whereby, even was mercury useful, time sufficient was not given it to act. To these I had to observe, that the mere novelty of a practice was no sufficient objection to it.¹⁹ That we were taught by frequent expe-

¹⁹ It is a pity that Dr. Lind, on advancing the following as a fact, did not give his authority ; for no such practice was ever known before the present period in these islands, nor in Jamaica ; if we judge by the silence of medical practitioners of that island who have written. “ If the patient, after the application of blisters, still continued very ill, and was delirious, with a low pulse, some have empirically given from five to ten grains of calomel, joined with camphire, which was said to remove the delirium,” &c. *Essays, &c.* ed. 1774, p. 267.

experience, that medicines not long since considered as dangerous, and even poisonous, have been proved to be among the most efficacious in certain diseases; that the received theory of the action of mercury on the human system was, perhaps, not founded on established facts: that in many instances, particularly inflammatory complaints, it did not account for the effects produced by it: that in the present instance, it was evident there was a change brought about in the system by it, when pushed to salivation, which obviated inflammatory diathesis, without weakening, in a dangerous degree, the powers of the living principle: that this effect was illustrated, by what has constantly and uniformly happened to those who have been cured of hepatitis by salivation, their strength having been comparatively increased after the mercury had ceased to act: that the nature of pestilential fevers was by no means generally well understood; the uncertainty of physicians with respect to it, being a principal cause of their fatality: that we find where the stages of these diseases have been well defined, and an appropriate treatment judiciously adopted,

the success of the practitioner has been proportionally great:²⁰ that a remarkable peculiarity appeared during the inflammatory stage of pestilential fever, in the inflammation seizing particular organs; in its often affecting them without any external signs of such affection; in its extraordinary tendency to gangrene; in its aptitude to run into the putrescent state, when much debility was induced; in its exciting an increased afflux of blood to the brain, whereby an uncommon exhalation of serous fluid from the extremities of the arteries of that organ taking place, compression ensued, of which the dilatation of the pupils of the eyes was an incontestable proof: that as the case was new, it could only be from what has been found useful in disorders of a nature nearly similar, we could make our selection of the means of cure; that the consideration of certain states of inflammation of the liver; of the confluent small-pox; and of the hydrocephalus internus;

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²⁰ Compare, for example, Sir John Pringle and M. Poissonnier on this disease; the balance of merit is strikingly in favour of the former, merely from the circumstances I have mentioned.

led us to give the preference to mercury : that the medical maxim “*de quo dubitare in ejusmodi re non oportet : satius est enim anceps auxilium experiri, quam nullum,*”²² should always regulate our practice in dangerous and dubious cases : that however short the time might be, we found salivation was often induced early enough to save the patient ; and that, although in certain states of the body, and in other climates, much difficulty might arise from the tardy action of mercury ; yet that, in every species of inflammation, and perhaps more especially those, the tendency of which to terminate in gangrene is great, and in a hot climate, no such difficulty existed in general, unless the medicine were to act on the intestinal canal, and consequently pass off without entering into the circulating mass. These observations had their due weight on many ; but the powerful influence of prejudice operating with all its baneful force on others, precluded conviction ; although they had the mortifying experience of the fatal tendency of the disease treated in the European way.

Dr.

²² C. lsi Medicina, lib. II. cap. 10.

Dr. Gilchrist many years ago entertained the most decided opinion of the antiphlogistic virtues of this medicine. His words are remarkable : " Nothing embarrasses more than inflammation in a low state ; but quicksilver is a powerful antiphlogistic, and removes inflammation without accelerating the motion of the fluids, which it rather diminishes, by subduing their inflammatory disposition. When there is little or no fever, it as powerfully resolves obstruction, without diminishing the impetus of the blood ; on a proper degree of which resolution depends."²² In several instances of the malignant pestilential fever I have observed a fact, which is certainly curious, and strongly illustrative of Dr. Gilchrist's opinion : In the low comatose state, when the mercury already exhibited failed of producing salivation, and of course of effecting the change in the disease, which is attended with signs of recovery ; and, when the stomach was sufficiently retentive, such stimulus, or such tone has been given by the bark,

²² Essays and Observations Physical and Literary, vol. III. p. 498.

bark, as enabled the former to act. The moment this was effected, signs of recovery appeared. In very acute inflammations of the liver, I have a thousand times seen, on the contrary, that the operation of the mercury is forwarded by diminishing the tone of the system, by means of very liberal bleedings. A similar effect to the former is also produced in ill-conditioned venereal ulcers, attended with hectic symptoms ; the use of the bark gives much efficacy to mercury ; and indeed the latter, in these cases, is seldom useful without the former. There is a singular observation of Dr. Huxham's on the low nervous fever, which may, I think, be brought forward here, as an analogical proof of the propriety of the practice described : "There is no evacuation of a more favourable portent than a pretty free salivation, without aphthæ. When this happens, with a kindly moisture of the skin, I never despair of my patient, however weak and stupid he may seem."²³ To multiply arguments and proofs drawn from analogy would be useless ; those already offered are surely

²³ Essay on Fevers, 6th ed. p. 88.

surely sufficient to justify even the *empirical* administration of mercury in the malignant pestilential fever, as it appeared here; wherein the danger was so imminent, when recourse was not had to bold practice. The foregoing table will, I trust, constitute a clear demonstration of this. I shall therefore only add a few words on the cause of the successful treatment of the sick of the 45th regiment. I mentioned on a former occasion, that the small number of deaths in that regiment arose from the mode of treatment adopted by Mr. White, a very ingenious young gentleman, who attended the sick in the absence of the surgeon. The disease being new, its symptoms remarkably insidious, and its fatal tendency very uncommon, Mr. White did me the honour to consult me, and request my opinion and advice. I mentioned to him the difficulties I had for some time laboured under, the result of my observations, and the treatment I found alone useful in the more violent cases; and recommended it to him as the most likely to be successful among his patients. He immediately adopted it, and has since frequently declared to me, that he

he did not lose afterwards one man, who had taken a sufficient quantity of calomel to excite salivation. Mr. White and myself were striking instances of the efficacy of the practice; we were both infected, were very dangerously ill, and cured by exciting salivation.

By comparative want of success in treating this dreadful malady with any other means than those I have mentioned, might render any account of them unnecessary. I shall, however, offer a few observations on the most remarkable of them, chiefly with a view to show how inefficacious remedies strongly recommended by experienced and judicious writers in certain states of the malignant fever, were found to be in the disease before us. When symptoms of local inflammation are so strongly marked as they were in many of the more violent cases of this disease, and in the low state, in which the strongest stimuli are indicated, blisters we should expect would be pre-eminently useful. Dr. Lind in several places recommends blisters as the most effectual remedy in the early stages of malignant

lignant and infectious fevers, and as often even preventing them. Nay, he goes so far as to consider the effect of blisters as the most certain proof of a prevailing infectious fever.²⁴ On the other hand, many, as Dr. Huxham, Sir John Pringle, Dr. D. Monro, M. Poissonnier, and Dr. Cullen, recommend blisters in the low stage only. The latter observes in general on this subject, that “blistering may be employed at any period of continued fevers; but that it will be of most advantage in the advanced state of such fevers, when the re-action being weaker, all ambiguity from the stimulant power of blistering is removed, and when it may best concur with other circumstances tending to a final solution of the spasm.”²⁵ In the present instance, however, blisters were of little or no use at any period of the disease, or wherever applied. In order to mitigate the intolerable violence of the headach, I have blistered the whole head, and the inside of each thigh, at once, in several cases, without producing the

²⁴ Dissertation on Fevers and Infection, ch. II. sect. 1.

²⁵ First lines, vol. I. p. 178.

the least change in that or any other symptom. I have had recourse to this remedy to lessen pain, to remove irritability of the stomach, and to raise the vital powers in the low comatose stage ; but always, except in two cases, without success. In one of these, a soldier of the royal artillery, the irritability of the stomach was completely removed by a blister applied to the scrobiculus cordis. The other case was singular. In a tradesman of the town of St. George, all the symptoms of the disease appeared, except the febrile heat. A blister was applied between the shoulders, without administering any medicine previously, except the solution, which operated very moderately. The effect was wonderful ; the discharge was uncommonly large, black, and foetid in an intolerable degree ; and the instant this took place the patient became better ; and soon after, without the use of any other remedy, recovered. A medical gentleman of the army, at that time with the 67th regiment, informed me, that in his own case, as well as those of four or five soldiers, he experienced extraordinary relief from the application of a blister to the forepart of the

head, or sinciput. It is probable that the cases of the disease he treated were less violent than most of those which occurred in my practice; otherwise it is impossible to account for so great a difference of result in the same practice.

From the history of the disease, it will not appear extraordinary that practitioners should have recourse to bark very early in it. The suddenness of the changes, and the apparent sinking of the vital powers a few hours after the accession of fever, naturally incline us to consider it as a disease wherein tonics and antiseptics, with the whole tribe of cordials, could be alone useful. But no indication can be more fallacious than this; and innumerable instances occurred of the fatal consequence of adopting it. The use of the bark in the violent cases of the malignant pestilential fever, immediately after the operation of the evacuating medicines, was hurtful in the extreme; many continued the practice, notwithstanding the glaring absurdity as well as danger of it. But by way of removing spasm, and obviating the tendency of the phlogistic symptoms, which they

they considered as unimportant, put in competition with the expected putrefaction, they accompanied it with warm bathing, either partial or general, and occasional purges. Their success, as might be expected, was proportional to the unaptness of the means.

In every case wherein salivation took place, little farther was required than the plentiful use of nourishing simple food, and wines. But when the mercury had not this effect, or when its action was so tardy as to give room for the most serious apprehensions of the event, it was necessary to have recourse to the bark. This medicine, in remittent bilious fevers, is seldom uncommonly disgusting to the patient; for although the stomach is very often irritable in these fevers, and consequently incapable of retaining the bark, yet the patient seldom expresses any dislike to swallowing it. In this fever, however, this medicine was extremely disagreeable to the patient, and the irritability of the stomach at the period when it became necessary was so great, as very frequently to baffle every attempt to render

render it retentive. Nature seemed to point out the impropriety of administering the bark, by not only rendering the palate abhorrent to it, but exciting such a degree of spasm in the stomach, as made that organ totally unequal to even the reception of it. Hence we are not to be surprised that the bark did so little in this fever. In fact, except in the third, and part of the second classes of patients, it was not a medicine to be depended on; and even in these, the success was obtained chiefly by the agency of other medicines in restoring some degree of tone to the stomach. Opium, so often useful in other fevers, attended with irritability of the stomach, was in this seldom beneficial. Burnt ardent spirits seemed to give a momentary relief; but it was merely momentary. Nor had a repetition of them a similar effect, for they were then instantly rejected. Blisters, I have already observed, did almost no good in this way. Tincture of bark, or a very strong infusion of it in Port-wine, was sometimes useful. But æther was the only medicine that was in any degree truly and permanently beneficial in enabling the stomach to receive and retain

retain the Peruvian bark. Many cases fully evinced this; and a few occurred in my practice, wherein the cure was completed by this medicine alone. The only writer I have met with, who recommends the use of æther in malignant pestilential fevers, is M. Poissonnier: “ C'est dans ce cas-ci surtout qu'on peut proposer avec confiance quelques petites doses d'éther vitriolique sur du sucre, afin de combattre plus efficacement la pourriture, et de retabler le ton de l'estomac, et de toutes les parties. Ce remede ranime, sans être incendiaire, et semble devoir remplir ici la double indication de soutenir les forces de la nature, et de s'opposer à la putrefaction des humeurs. Je fais qu'à la Cayenne, où une maladie à peu-près de cette nature, a enlevé les quatre cinquièmes des personnes qui étoient passées dans cette colonie, plusieurs malades reduits à l'extrémité, ont dû leur guérison à l'usage qu'ils ont fait de ce remede, et qu'ils prenoient même en assez grande quantité.”²⁶ This ample testimony was sufficient encouragement

²⁶ *Maladies des gens de Mer.* tom. I. p. 351. See also something to nearly the same purpose in “ Observations sur les Maladies des Negres, par M. Darille.” p. 49.

rageinent to try it in a malady that had hitherto resisted all the means usually recurred to. The event justified the practice. I gave the æther in the following manner. The patient being allowed to remain undisturbed about an hour, I gave him about a tea-spoonful in about half a wine-glasfull of cool water. After this he continued undisturbed about two hours, when the dose was repeated. At the expiration of another hour, the bark was offered him; and if he swallowed and retained it, the æther afterwards was given only once in five or six hours. But as this very seldom happened, it was generally necessary to repeat the æther in the same quantity every three hours, till the spasm of the stomach was entirely overcome. Æther, given in the manner I have mentioned, is extremely grateful to the patient; it occasions an agreeable warmth along the œsophagus, and gently stimulates the stomach. This effect, however, does not continue long; but the frequent production of it at length gives it permanency. It appears to act as a tonic, an antiseptic, and an agreeable stimulant; a warm glow overspreads the

the surface, and thirst, nausea, and oppression often have fled before it. I have generally during the exhibition of the æther, and till the stomach became retentive, ordered bark to be administered in the form of injections.

With respect to injections of bark in general, a great deal cannot be expected from them. In the disease before us, when the case was of the more violent kind, the spasm which affected the stomach, prevailed more or less throughout the whole length of the intestinal canal; consequently the injections were almost always immediately voided; or if they were retained, so little of the antiseptic part of the medicine was absorbed, as to be totally inadequate to combat the rapidly increasing putrescence. In a state of the intestines so highly morbid, the action of the absorbents must have been imperfect; or if, with Dr. Cullen, we consider the operation of bark as arising merely from a tonic power, the spasmodic state of the intestinal fibres must have prevented any efficacy from its application to them. But as the tonic power of this medicine could

could be alone efficacious, I did all in my power to obviate the spasm, by antispasmodics, by distension of the fibres of the rectum and colon, and by the addition of Port-wine to the bark. The antispasmodics I used were, opium in watery solution, asafoetida, and camphor rendered soluble in water by mucilage; but I derived very little benefit from any of them. The most useful was the opium, of a strong watery solution, of which I generally added two tea-spoonfuls to an injection composed of an ounce and an half of bark, and eight or ten ounces of water moderately warm, or of strong chicken-broth or beef-tea. This injection was repeated, day and night, every three hours; and if uniformly retained, a laxative injection was administered once in the twenty-four hours to carry off the accumulated bark, which, otherwise, gave the patient considerable uneasiness. With a view to overcome the spasm by distension, I had a pint and a half of the above mixture injected into the rectum, and ordered an assistant to compress the anus with some degree of violence, by means of a towel well rolled up, the instant the pipe of the syringe

syringe was withdrawn. This sometimes succeeded, when the patient could be prevailed on to lie quiet in one posture; but in most cases, the patient being comatose, delirious, or restless, from the general uneasiness and oppression which then prevailed, it could not be put in practice.²⁷ The total inability of the stomach to receive either medicine or nourishment in many cases; and the inefficacy of the bark injections described, in obviating or correcting the tendency to putrescence, at length induced me to use Port-wine, as the most restringent, instead of the water, chicken-broth, or beef-tea. As the practice was not warranted by any medical authority, I

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²⁷ In the very troublesome spasmodic affection of the stomach and œsophagus, particularly the latter, called Hiccup, or Singultus, proceeding from irregularities in diet, nothing sooner or more effectually relieves than distention of the œsophagus by the detention of as large a quantity of very cold water, as possible, in that passage, for a minute or thirty seconds. This is easily effected by throwing the head back, and putting the muscles of deglutition into action, in such a manner as to compress the œsophagus. I have often experienced the good effects of this operation; and it was this which first induced me to try the above practice.

confess it was after some hesitation I ventured on it; and my hesitation arose chiefly from a fear of the irritation which the wine might occasion when applied to the tender surface of the intestines; and, in a healthy state, perhaps very untoward symptoms might be the consequence. But in the present morbid state of these viscera, so far from its producing irritation, I found it a most useful, and not unfrequently a very efficacious practice. To two ounces of bark, I added as much Port-wine as rendered the mixture sufficiently thin to pass through the pipe of the syringe; and after adding the usual proportion of the solution of opium, had it administered every three hours, taking care to use a considerable degree of compression on the anus for some time after, to prevent its being too soon passed. Although this medicine was by no means always effectual in stopping the progress of putrefaction, yet it was infinitely more so than any other antiseptic combination used in this way, when the stomach did not admit of the exhibition of bark in any other. Perseverance, however, was absolutely necessary in order to produce

duce the desired effect ; and it was also equally necessary to leave the stomach undisturbed, as long as any irritation remained in it.

Frequently baffled in my endeavours to fulfil the third indication of cure, by the exhibition of the bark in the forms I have described ; and often induced from many of the symptoms, as well as the general character of the disease, to consider it as a plague or pestilence ; I had, in a few cases, recourse to the practice described by Dr. Guthrie, and said by him to be uncommonly successful in the treatment of the plague by the Russian physicians. I followed it exactly, with this exception only, that the dread of producing or increasing irritability, prevented me from repeating the emetics so frequently as recommended by the Russian physicians. The result of this practice is laid down in the foregoing table, from which it appears, that as the number of unsuccessful cases was exactly equal to the recoveries, the encouragement to proceed was not very great. One of the patients treated in this way, Martin Gray, a soldier

of the royal artillery, had been apparently cured by mercury, without its producing salivation ; but having relapsed, I put him on this course. After a flattering but momentary change on the fifth, he died on the seventh day. Another of the same corps, Richard Ducket, had recovered in the same manner, by means of mercury, but relapsing, he was treated in this method, and recovered. This difference of result in circumstances exactly parallel, must have arisen from the former being a recruit just arrived from Europe ; the latter, near three years in the climate.

It may not, perhaps, be considered as foreign to my subject, to remark here, that in the furunculus, which prevailed very generally almost immediately after the malignant pestilential fever had abated about the end of August or beginning of September, I found the combination of bark and sulphur, which forms part of the above plan, a most excellent remedy in increasing the eruption, and promoting the suppuration. These furunculi, or as they are commonly called, Blind-boils, were very large, seldom

seldom less than an inch in diameter, very painful, and discharged a very uncommon quantity of purulent matter, frequently mixed with ichor. They appeared on every part of the body; but in greatest number near the scrotum, the hips, and on both upper and lower extremities.

Wishing to leave nothing untried that promised any relief to my patients in this fatal malady, I determined on trying what the Angustura bark would do. On a former occasion, this bark seemed useful in an irregular fever depending on local disease. Since then, I have read Mr. Brand's "Experiments and Observations on the Angustura Bark," wherein its efficacy, as an antiseptic and tonic, are highly commended in various states of fever. Encouraged by these, and perceiving that this bark possessed a pungency or spicy taste, a quality which the Peruvian bark had in a very inferior degree, I made use of it, in expectation that by gently stimulating the stomach, and thereby obviating the spasm with which that organ was affected, it might have a better chance of being retained. I did
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not begin to use this medicine till towards the end of July, and gave it in only twelve cases. Five of these were soldiers of the royal artillery ; and the remaining seven, inhabitants and transient people. The former recovered with remarkable rapidity, and three of the latter ; so that only one in three died. Although this success was greater than I expected, I did not think myself justifiable in trusting altogether to the Angustura bark, when I was possessed of a remedy more certain in its effect, and of whose safety extensive experience had fully satisfied me. From the event, however, it was evidently a more suitable medicine than the Peruvian bark. Three of the five of the artillery, who took the Angustura bark were young men, who had never entered the torrid zone before, and were almost total strangers to the climate ; and those who died were sailors, who had only lately arrived from Europe. It was evident therefore, that although frequently an useful medicine, and although it generally agreed with the stomach, it was by no means to be safely depended on in cases of great violence. I always preceded the administration

stration of this medicine with the deobstruents and diaphoretics I have already mentioned ; and after the operation of these, I gave a scruple of the powder of the Angustura bark mixed with water, every hour, or two scruples in three hours. In the eight cases wherein this practice was successful, I was astonished to see an almost immediate change take place ; for instead of the heat being increased, and the surface becoming dry, which too often followed the too early use of the Peruvian bark, an agreeable glow, an increase of warm sweat, and a diminution of pain were the consequences. For instance, if the patient was seized with the usual symptoms on the evening, I had immediately the vomit administered, and repeated if necessary ; this was followed up, as soon as possible, by the cooling diaphoretic, or with the saline draughts, with a sufficient addition of the bitter cathartic salts ; or instead of all these, the solution of salts and tartarised antimony, in the manner already described. These having operated sufficiently during the night, I began the use of the Angustura bark in the morning. By the following evening,

all the symptoms were relieved ; and on the second morning, the patient was up, walked a little, and had some appetite ; and from that time, using occasionally the Angustura bark, he continued to recover. How different this from the effect of the Peruvian bark ; nausea, vomiting, heat, dry skin, quickened pulse, increased pain ; often succeeded by coma, delirium, &c. and seldom administrable without æther. Upon the whole it appeared, that the inefficacy of the Angustura bark in the more violent cases, arose from the irritability of the stomach being greater, and less tractable in them ; and from an insufficiency of the antiseptic power in the bark itself.²⁸

Having

²⁸ From some experiments I made, after the above successful exhibition of the Angustura bark in the malignant pestilential fever, with a view to discover to what particular qualities it possessed, this success was to be attributed, I was induced to refer it to an uncommon quantity of fixed air or aerial acid, and to a volatile alkali which this bark appeared to contain. As however experiments of this kind are often subject to deception, I shall not take upon me to speak with certainty on the subject. But in order that the experiments I allude to may be repeated by those more experienced in this way than I am, I shall insert them here.

Having thus offered the most important observations I made in endeavouring to ful-

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here. "In order to discover whether this infusion, made of one ounce of the powder of Angustura bark in eight ounces of water, contained any fixed air or aerial acid, I added to one ounce of it filtered, a small quantity of filtered lime-water. The infusion became immediately turbid, and of a dirty yellow colour approaching to white, and deposited soon after, on the sides and bottom of the glass, a small quantity of a greyish-white powder. The infusion, after the powder subsided completely, was perfectly transparent, and of a beautiful amber-colour." "To two ounces of the infusion, I added a small quantity of a watery solution of corrosive sublimate. The mixture became instantly whitish, which, no doubt, had the colouring matter of the bark been wanting, would have been milky; a whitish powder was soon after precipitated." The infusion of pale Peruvian bark suffered no change on the addition of lime-water; but with the addition of the watery solution of corrosive sublimate, it became instantly whitish, and a precipitation of a whitish powder took place. The antiseptic power of this medicine in infusion is evidently extremely weak, but not so in powder; thus, the infusion with fresh meat becomes highly offensive in thirty hours, in the common temperature of the air; that is, in a heat at an average about 83 degrees of Farenheit; but a piece of meat of equal weight, viz. two drams, well rubbed with the powder and wrapped in a piece of paper, placed in the same heat, was perfectly sweet at the end of ten days,

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fil the three first indications of cure of the malignant pestilential fever, I shall now treat of the fourth, viz. to restore tone and energy to the system when the patient was in a state of recovery. Change of air and suitable diet were the means I found most useful; for, contrary to most febrile diseases, bark was here either useless or hurtful; and, as I have already remarked, the patient seemed instinctively to reject and loath it.

As long as the patient remained in the infected room or house, although all symptoms of the disease had disappeared, the progress of his recovery was remarkably slow. And here I may also observe, that his restoration to health seemed to bear a pretty exact proportion to the means used in overcoming the disease. Headach, a heavy dull eye, with a considerable protrusion

no other smell being perceptible but that of the bark. Does this corroborate the result of the above experiments? And is not the remarkable efficacy of this medicine in dysentery, which I have frequently experienced, to be attributed to the powers ascribed to it here? For the above tests, see Bergman's *Physical and Chymical Essays*, Cullen's Translation, vol. I. p. 32, &c. though, as they are applied in the preceding experiments, may be fallacious.

sion from the orbits, low spirits, thirst, and a total want of appetite, were the general consequences of the treatment with bark, without the previous use of deobstruents, and the appropriate antiphlogistic. None of these unpleasant feelings attended convalescence, when the disease had been removed by mercurials; and I had frequently reason to imagine, that a serous accumulation continued in the brain a considerable time after the disappearance of the disease, when treated in the former way. Compression indeed was evidently indicated by the appearance of the eyes, the continual头痛, a frequent nausea, and a tendency to stupor and sleepiness; and as no means were used during the existence of the disease to excite an absorption of the exhaled fluid in the brain, it was highly probable that the compression arose from this deficiency. Although nothing of this kind followed the mercurial plan, extreme debility was the immediate consequence of the disease in all cases. But there was always this distinction observable, that convalescent debility was of much shorter duration after treatment with mercury than the other.

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It appeared that the infected air of the room in which the patient continued to reside, although it could never renew the disease, stimulated the stomach in such a manner as to produce an effect almost equally dreadful. To obviate this evil, a change of air and situation became absolutely necessary the moment signs of convalescence appeared; and indeed, of all the means I know for recovery from this state of debility, it is the most efficacious. Even the instant the patient was carried into the open air, he was sensible of a wonderful degree of refreshment; and the purer the atmosphere, and the higher the situation of the place, provided there was no dampness, the speedier was his acquisition of strength. The instances of this were innumerable; as were likewise those of a contrary treatment. The 45th regiment afforded one of the most remarkable of the former. The sick soldiers, as soon as they were able to bear any degree of motion, were sent to Hospital-hill, where they were kept till they acquired their usual health; which happened in a surprisingly short time. The distance from Fort George, where the regiment was stationed, to the barracks

barracks on Hospital-hill, is fully a mile; and the ascent for the most part is very considerable. Although the sick, at the time they began their walk, or ride, from the Fort were apparently so weak and languid as to be scarce able to bear exercise, before they reached their barracks, instead of being overcome with fatigue, they were sensibly better and stronger. The change to a purer air, a high rocky situation, abundance of good water, and the distance from infection, produced an alteration in a few days; and this was rendered still more remarkable, by their accommodation being cold and exposed to the weather; for the barracks in which they were lodged, were so much decayed as to admit the rain and wind almost every-where. Under circumstances which did not admit of changes of this nature, much benefit to the patient accrued from the moving him from the infected chamber to one adjoining. In the hospitals this was frequently done, and always with the best consequences. I have even extended this removal to that state of the disease which immediately succeeds the inflammatory, and frequently with evident

advantage ; nor is it to be wondered at, since it is easy to conceive that the violence of a contagious disease will increase in proportion to the accumulation of infection in the atmosphere immediately surrounding the person afflicted with it. Something of this kind was done on ship-board, where the accommodation was in general wretchedly bad and confined. In a few of the ships, the captains had the humanity to give up their cabins altogether to the sick ; and in these, the sick enjoying sufficient room, good air, and better ventilation than between decks, the mortality was infinitely less. As I considered cleanliness and free ventilation as two principal agents in destroying contagion, I always enjoined particular attention to them : where these were more immediately in my own power, nothing was left undone to effect them. In the royal artillery hospital, when the disease was almost at its height of violence, I had all the wards successively white-washed ; in doing which I effected another object, the removal of the sick from the infected wards to others that were not so. After each ward was white-washed, I had several

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port-fires²⁹ burnt in it, and the smoke confined for several hours; and afterwards well washed with hot vinegar. Twice or thrice in the week, moistened gunpowder was burnt in each ward; and thrice in the day, the floors and bedsteads of the sick were sprinkled with vinegar. But in order to destroy the seeds of infection as completely as possible, all the blankets, shirts, flannel jackets and waistcoats of those who died, were burnt immediately after their death; and the bodies carried to a dead-house, some yards distant from the hospital. Sheets, shirts, and other wearing-apparel of those who recovered, were first well fumigated with gunpowder, and afterwards washed, before the patient was discharged. The captains of some of the London merchantmen, had the hold and lower decks daily well fumigated with moistened gunpowder, during which the hatches were kept

²⁹ Port-fire is a composition of two-fourths of sulphur, one-fourth of nitre, and one-fourth of meal or powder of charcoal, rammed into paper tubes two feet long, used in firing off cannon, mortars, and other pieces of ordnance, in lieu of slow-match, formerly used.

kept close shut. All the under-decks were also frequently washed with hot vinegar; and fires were occasionally lighted below. The beneficial consequences of this attention were remarkably conspicuous; their men recovered their strength surprisingly fast, and suffered no relapse; and new men who were taken on board to replace those who fell victims to the disease, continued well and untainted. It was otherwise with ships on board of which these precautions were not observed; relapses, or rather a suspension of the disease, were not uncommon, and new men became immediately infected. On the 19th of May, a letter of marque belonging to Liverpool, brought into St. George's the crew, thirty in number, of a French vessel she had captured on her passage from England. These, on account of the scarcity of seamen, were distributed among the merchant-men most in want. Many of these people were immediately infected, and died; and it is remarkable, that the lot of these unfortunate men was to be put on board the least cleanly, and of course the most infected ships.

Suitable diet was the next means of restoring tone and energy to the system. During the existence of the disease, it was of little importance whether the patient took nourishment or not ; and indeed, from the circumstances under which the sick generally laboured, it is evident that nothing material in this way could be administered. It was otherwise, however, the moment signs of recovery took place : the great object was to select such articles of food as were most palatable, most simple, most nourishing, and of smallest bulk ; for nausea was readily excited, the general debility was very great, and the digestive powers were very imperfect. Most liquid aliment, especially soups, were extremely disagreeable, and readily excited nausea ; meats were sometimes acceptable, but very few were admissible. Sago, panada, and the preparations of the Indian arrow-root,³⁰ with a large proportion of Madeira wine, well spiced, were by far the most agreeable, the lightest, and most nourishing. To these therefore, with occasionally the addition

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³⁰ *Maranta Galanga*, Linnæi.

of a soft fresh egg, I confined my convalescents; and I regulated the manner and frequency of giving them, by the rule laid down by Celsus. “*Cibus non multus quidem, sed s̄epe tamen nocte ac die dandus est; ut nutriat neque oneret.*”³¹ It is remarkable, and totally contrary to what happens during convalescence from other fevers, that wine in general was extremely disagreeable to the patients; and it was with much persuasion and difficulty they could be prevailed on to use it. Madeira and the richer sweet wines were the most unpalatable; Hock and Rhenish wine were often taken with pleasure; but Port-wine was the least unpleasant of any. All convalescents were uncommonly fond of porter and small beer; and, when permitted, greedily swallowed large draughts of them. As they always agreed well with the stomach, and as it was of the utmost consequence to please wherein it could be done without injury, I generally indulged them in the liberal use of these liquors.

Riding

³¹ Lib. III. cap. 19.

Riding, and moderate exercise of any kind, contributed very much to the restoration of health.

In some, whose viscera became permanently diseased from improper treatment or imprudence, hectic heats and colliquative sweats and diarrhœas took place. Several of these who could not change the climate, fell victims to this sequela of the malignant pestilential fever. Milk diet, country air, and cheerful society, had some effect in relieving these patients ; but a northern climate was always the last resource, where it could be obtained.

Before I conclude this part of the task I have imposed on myself, I cannot help observing, that as the majority of the most useful part of society are daily exposed to the ravages of one of the most destructive calamities mankind are subject to, we have reason to consider ourselves as extremely fortunate in possessing a remedy which, under certain circumstances, may be depended on in the cure of it. There is, no doubt, the influence of old habits, and medical

dical authority to be combatted, ere the practice I have recommended can be generally adopted; but it is to be hoped that these will yield to facts and experience, the physician's only certain guides in the treatment of disease. Little encouragement is held out by the result of the practice hitherto generally resorted to in malignant and pestilential fevers; but, authorised by men highly eminent in their profession, it has become a kind of false beacon, directing the young and unexperienced to measures full of inconceivable mischief. An instance will illustrate this: Dr. Schotte, in his very ingenious Treatise on a Contagious Fever which raged fatally at Senegal, observes, that "he did not think himself very blameable in not administering laudanum sooner; for what can a young practitioner do better, than follow the rules and precepts laid down by celebrated clinical authors?"—"Opium I was prevented from giving, by those cautions which are met with in the writings of many eminent authors, as preventing nature in its operations, and putting a stop to its salutary intentions."

tentions."³² How much is it to be regretted that Dr. Schotte should in so melancholy an extremity forget that he practised in the torrid zone, where cautions necessary, perhaps, in London and its neighbourhood, are not admissible ! How much mischief might have been prevented, had his judgment been unshackled : had he boldly, on an occasion which demanded new and decisive measures, thought for himself : had he investigated more fully, more especially by dissection, the nature of the disease he treated : had he known, or adverted to the anti-phlogistic virtues of mercury, and the infinite advantage arising from the promoting of absorption in a disease so evidently depending on local derangement. As a physician offers himself to the public as the declared enemy of disease, in every form it may assume ; as he consequently pledges himself to leave nought undone which he knows can, or which promises to be useful towards the obtainment of the object in view, is it not incumbent on him, as a preliminary step, by every possible means to dis-

³² Treatise on the *Synochus Atrabiliosfa*, p. 139, 140.

discover the nature of the malady he is to combat with ; and even should there be danger in the attempt, does it not display a most unpardonable timidity, a medical lachét  stamped with characters uncommonly prominent, should he shrink from it when life or death is the object to be obtained, by a little exertion of fortitude ?

“ It is a physician’s duty to do every thing in his power, that is not criminal, to save the life of his patient.”³³ And, to use a plain and rather trite simile, an able physician, like a skilful general, should inform himself fully of the number, the strongholds, the advantageous positions, the vulnerable points of the enemy, before he seriously attacks. When he has acquired the necessary knowledge, his enemy falls before him ; because he knows where to attack him with superior advantage. It must be confessed, however, that the part a young practitioner has to act in hot climates is extremely difficult where, to use the words of an ingenious and amiable writer on another occasion, “ diseases are found complicated

³³ Lectures on the Duties and Qualifications of a Physician, p. 39.

plicated in endless varieties ; which occasions an embarrassment which nothing can remove but a habit of nice discernment, a quickness of apprehension which enables him to perceive *real analogies* ; and, what is rarely united with this, a solidity of judgment, which secures him from being deceived by *imaginary ones.*"³⁴

It may be expected from the opportunities I had, not only of seeing the malignant pestilential fever in all its various degrees of violence, but also of investigating the causes which might produce and promote it ; that useful information may be the result of my observations with respect to the means of prevention. The importance of an inquiry of this nature is manifest, and perhaps in the torrid zone, of more than in any other ; because in it the agency of cold can never interpose to prevent the ravages of a pestilential disease ; nor is there ever observed that degree of heat which destroys pestilential infection in the warmer regions of the old continent.

Some

³⁴ Lectures on the Duties and Qualifications of a Physician, p. 15.

Some late travellers observing more accurately, or possessing means more adequate to the investigation of truth than their predecessors, have thrown much light on the causes and source of pestilence. The Baron de Tott, who we have reason to believe had the best means of information, says, that the plague would be unknown in Egypt, were it not for the contagion which is introduced by the trading vessels from Constantinople ; that it is in Alexandria it first manifests itself ; that it rarely reaches Cairo, although no precautions are used to prevent it : “ où les chaleurs la font bien-tôt cesser, et l’empêchent de penetrer jusques dans le Saïde.”³⁵ M. Savary, who resided a considerable time in Egypt, observes in his forty-fourth letter, that Smyrna and Constantinople are the foci of this frightful malady ; from whence it is always imported into Egypt, which, otherwise would be exempt from it. He adds, “ Another remark, deserving our particular attention, is, that the extremes of heat and cold are alike enemies

³⁵ Memoirs du Baron de Tott sur les Turcs et les Tartares, tom. IV. p. 57.

enemies to this terrible contagion. The winter puts an end to it at Constantinople; the summer destroys it in Egypt. It scarcely ever reaches the polar circle, and *never passes the tropic.*³⁶ The original causes of plague, and all its modifications, are unquestionably accumulated human effluvia in close hot rooms, filth, and the hoarding up of woollen clothes and bedding used by infected persons. All writers agree in this; and the observations of Dr. Guthrie have thrown

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³⁶ The last part of M. Savary's remark does not appear to be now altogether well-founded, since we may certainly consider the disease, which is the only subject of these sheets, as a plague modified by the uniform heat of the climate into which it has been introduced. Does not the ceasing of this disease at Philadelphia at the commencement of winter, constitute a proof of this? Some objections may arise from its being considered as doubtful, whether the disease which raged here was the same as that which proved so fatal in Philadelphia? That they were the same, the following fact renders evident: A vessel belonging to Philadelphia introduced the disease into St. Pierre, Martinique, in October, 1793. Another vessel from New London touched at St. Pierre, in her way to Grenada, and received the infection. On her arrival, in February, 1794, the sick were put under my charge; and I found the disease to be my old enemy, the malignant pestilential fever. I treated it with mercury, and was successful.

much light on the manner in which these causes act to produce so dreadful an effect. Baron de Tott has given the public a most important observation with respect to the manner in which the plague is propagated at Constantinople : “ Qui qu'il en soit il n'y a point d'incertitude sur le foyer qui la conserve, ni sur les causes que la propagent. On retrouve l'un et l'autre, chez les marchands fripiers de Constantinople, et chez les particuliers qui conservent dans leurs coffres tous les vêtements, les fourures mêmes des personnes mortes de la peste. C'est sans doute prendre le moyen le plus efficace pour en fomenter et en perpétuer le germe,” &c. This observation was fully illustrated by the conduct of individuals in the lower classes of the inhabitants of this town. Many of these derive their subsistence from retailing rum of the cheapest and worst quality to sailors, soldiers, and sailor and porter negroes ; and as the detection of this practice, which is not permitted by law, might be destructive to their views, and ruinous to their little capitals, they carry it on in booths, and small wooden buildings of little value, erected near the wharfs, or under the shelter of large houses,

houses, or in lanes and places out of public notice : to these, persons of the description I have mentioned are encouraged to resort, where they soon become intoxicated, and are crowded together in a hot, putrid, or infected atmosphere, till they recover their senses ; when they generally find themselves precipitated into a fever of a most malignant character. Into these sinks of pestilence and destructive dissipation, captains of vessels, during the prevalence of the malignant pestilential fever, induced by the apparent cheapness of the accommodation, hurried their wretched sailors labouring under the disease in its worst form. The moment they entered them, their fate was generally decided, since the best digested plan of cure, and the most appropriate remedies could not overcome a disease whose violence was continually accumulating by the surrounding infection. But the evil did not cease with their lives ; their mattresses, blankets, and wearing apparel, wretched as they were, became an object of value in the eyes of these insidious plunderers ; and whether they were hoarded up in these places, or disposed of to others, still being preserved,

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they became the semenium of the disease, and were the principal means of propagating it. Another cause contributed not a little to support the contagion : From the indolence peculiar to all classes of people in this climate, and from the novelty of the thing itself, few paid the necessary attention to sweetening and ventilating the rooms of the sick when the disease ceased ; from this it frequently happened that a healthy person on entering any of these infected rooms, was instantly struck with the infection. These facts demonstrate, that means are always in the power of the inhabitants of the torrid zone to check or prevent contagion. That the disease therefore might have been prevented in the first instance, and that the propagation of it afterwards might have been confined to those places which first received the infection, is certain, had the nature of it been properly understood, and had laws which oblige the observance of quarantine been in existence. But much, very much depends on individual prudence, as well as public policy ; and it is to be feared that plans of prevention, however well adapted they may be

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to the local situation and other circumstances of the case, will always prove abortive in the West India colonies, from a constitutional want of energy in the executive government; from a kind of deficiency in the public spirit of individuals; and because, as Mitio in the play observes,

“ Homine imperito nunquam quidquam injustices;
“ Qui, nisi quod ipse facit, nil rectum putat.”³⁷

A general plan of prevention has, in these colonies (particularly Grenada) for its objects, the destruction of all small wooden buildings erected purposely for the accommodation of the lowest class of white people, and free people of colour; who, renting them with no other view than to retail rum of the worst quality, and to harbour poor transient persons, in order to despoil them of their scanty property, become the greatest nuisance in West India towns, and literally the pest of society. The obliging the inhabitants to build with stone or brick, and to lay out the plan of their buildings in such a manner that the streets may be spacious, and

³⁷ Terentii Adelphi, A. I. S. 11.

and subject to the perflation of the prevailing winds ; the rooms as large as the general dimensions of the house will permit ; stables, necessaries, and all other erections of that kind, at a distance from the dwelling-house, not less than twenty feet ; certain places built at individual or general expence, to which all filth shall be early in the morning carried ; from whence, at stated times, proper persons paid by the public shall carry it to a distance from town. The obliging butchers to slaughter in places so far distant from town, and so situated as not to affect the atmosphere with the offensive fœtor arising from offals and putrid meat ; and proper sheds or stalls well ventilated, and as near running water as possible, to be built at the expence of the public, to which butchers and all others who slaughter meat for sale, shall be obliged to carry their meat at certain stated hours, which should be as early in the morning as possible. The appropriating a certain portion of ground for the burying of the dead, at some distance from town, and to inclose it with a stone wall. The enacting of a law which shall involve in it the foregoing objects :

objects the prohibiting the retail of rum, except under certain limitations: the appointing of proper persons with adequate salaries, to be denominated officers of health; the duty of a certain number of whom, shall be the preventing the erection of buildings of the description mentioned: the regulating the licensed rum stores: the superintending the general regulations, relative to cleanliness, ventilation of streets and houses, butchers stalls, and slaughter-houses, burying-grounds, &c. and preventing the landing and lodging of any infected person or thing, or any person or thing suspected of being so. This law should authorize the remainder of the officers of health thus appointed, to visit all ships which shall carry on trade with the island, and after ascertaining their health, or the existence of a contagious disease on board, or which had lately prevailed on board, to permit them to enter the harbour, and land their cargoes or to oblige them to retire to a place appointed for the performance of quarantine. Proper places for this purpose must be chosen, on which lazarettos or pest-houses, and stores or sheds shall
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be erected, in which the crews and goods on board shall be lodged and purified by the means so copiously treated of by Dr. Mead, Dr. Lind, and others. After remaining there a term of days, not exceeding fourteen, the officers of health shall grant their certificate of the healthy state of the crew, and purification of the goods: on which, the vessels shall be permitted to enter the harbour, and land their cargoes. Authority should also be vested in these officers of health, subject however to the controul of magistrates or justices of the peace, to fine or inflict such other punishment as delinquents, in any of the cases specified, shall be judged deserving of. And in order to give more efficacy to these regulations, perhaps it would be a wise measure in the legislature, if they are constitutionally competent to it, to enlarge the powers of the governor in such a manner as may enable him to act with energy on such occasions as these, and prevent the repetition of delinquency, by inflicting punishment in a more summary way than he can at present. The obtaining these improvements in the police of West India towns, and the enforcing

forcing obedience to these regulations, must altogether depend on the public; and it is to be presumed, that the great importance of their object will be a powerful stimulus to the legislative body, in enacting with all due speed the necessary laws for the effectual establishment of them.

The means of prevention which more immediately depend on the prudence and exertion of individuals, have been so often and so ably stated by writers on this subject, as to render it unnecessary for me to enlarge on them here. When an individual of a family has been seized with a contagious or pestilential fever, care should be taken to prevent all, except those who are necessary in attending him, from going into the room in which he is confined; if he recovers, the bed-clothes and wearing apparel which he used during his illness, should be as soon as possible destroyed by fire; his person well washed, and dressed with clothes that cannot be subject to suspicion; he should be carried into the country, if possible, and remain in it till he acquires his usual degree of strength: the room he lay in should be

new painted if wainscotted, or white-washed if otherwise; and the floor and ceiling, doors, window-shutters, &c. should be well scrubbed, and the whole afterwards fumigated with moistened gunpowder; the attendants, before they again mix with society, should be obliged to purify their persons, and change their clothes. When the disease appears on ship-board, the sick should be instantly separated from the healthy, and carried to a place on shore, from which the infection cannot spread; the space between decks, the hold, the cabin, should be immediately well scrubbed, and, if it can be done, white-washed; fires should be lighted in the hold and between decks, and whilst they are burning, the hatches should be kept close shut; and the whole for several days should be carefully fumigated and sprinkled with vinegar. But as the hammocks and mattresses of seamen are more subject to receive and retain infection than any thing else on board, the greatest care should be taken to wash them well; and if any have been used by the sick, to burn them. A remarkable instance of the efficacy of these means of prevention on ship-board, I have

at present (February 20th, 1794) before me. The ship Mary of Liverpool, of 26 guns and 70 men, received the infection either from an American vessel, the crew of which had been infected at Martinique, or from the rum-shops I have already described. I advised the captain to separate the sick from the healthy, and if possible to send them on shore; and afterwards to wash all the decks well with vinegar, to light fires between decks and in the hold, and to fumigate the whole with gunpowder. He complied with my directions, and the result has been most happy; for after the four in whom the disease appeared were sent on shore, and the means I have mentioned were used, the disease entirely ceased to spread. I may observe here, that some of the methods recommended in Europe for preventing the spreading of a contagious disease, are not always necessary, the climate itself in some circumstances doing what in Europe, particularly in Great Britain, must be done by artificial means. I shall only mention two instances. It is by no means necessary, or rather it is augmenting the virulence of the contagion, to shut up fami-

families in their houses, when an individual of it has been seized with the disease. I have already observed, that the sphere of infectious atmosphere in this climate, has in no instance exceeded ten feet ; and that all beyond that, have remained untainted. It therefore is evident, that a measure of this kind would not only be unnecessary, but extremely hurtful ; for confined air in the torrid zone, becomes in a very short time totally unfit for respiration, however large the rooms may be : a proof of which is the oppression and other uneasy symptoms a person is sensible of in a room, the doors and windows of which are close shut. For the same reason, what has been proposed by Dr. Lind, if executed in this climate, would produce an effect in every respect reverse of that which that ingenious and experienced physician expected from it. His proposal is, that "the dispersed sick should be carefully collected into one place, and the houses be purified on their removal ; as others are taken ill, they should also be immediately put with the sick, and in a short time, the infection

will

will be wholly confined to one spot."³⁷ In a climate whose temperature generally varies little, any thing like crowding patients, labouring under the action of pestilential contagion, must appear, *prima facie*, in the highest degree improper. It is therefore hospitals, unless they have been constructed on a very large scale, that have always been hurtful. On every account, separate rooms are better, were they even huts, providing due care is taken to ventilate them properly, and keep them clean. A striking illustration of this is, what happened in the royal artillery hospital of this island, already related; and it is the more deserving of attention, as the hospital is a stone building, situated in the most favourable situation possible for ventilation; as the rooms are large, lofty, and well perflated in every direction; and as every thing is kept remarkably clean and sweet.

Those whose business or duty lead them to the chambers of the sick, should be particularly careful to avoid entering them with
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³⁷ Dr. Lind's Essays, p. 350.

an empty stomach ; or when they are heated ; or when they are in perspiration. The last caution is more particularly to be attended to, as the pores of the skin in that state, may be considered as so many open mouths ready to receive and swallow the infectious effluvia ; which no possible means can prevent. The usual manner of using the aromatic gums, or keeping camphorated or aromatic vinegar to the nose, or suspending small bags of camphor, musk, asafœtida, &c. on the breast, as I have already observed, have not the smallest efficacy in preventing infection when the body is exposed to it. But as it is evident that the contagious effluvia do not extend themselves beyond a limited distance from the infected person, so the best preventive must of course be the taking care not to go nearer the sick, if possible, than the limits of the infected atmosphere. The duty, however, of physicians, nurses, and other necessary attendants, must render their observing that precaution impossible ; they must therefore trust more to their temperance than prophylactics of this kind for exemption from infection. One caution, however, may be useful even

to them, if strictly observed. It is probable that the matter of contagion enters the body more readily by the lungs and stomach, than by the skin; consequently, if care be taken to keep the mouth and nostrils shut during the examination of the patient or the more immediate attendance on his person, by means of handkerchiefs sprinkled with any antiseptic fluid, particularly camphorated vinegar, or the little balls recommended by Dr. Lind, there will be less risk of their receiving the infection. Although I have little faith in amulets, and indeed none of the tribe recurred to here were useful during the prevalence of the malignant pestilential fever, perhaps the singular one mentioned by Dr. Lind, may be employed on these occasions with advantage. I mean the quill filled with quicksilver, and corked at each end, carried in a pocket near the groin, which the Doctor says, "several surgeons in our hospitals, who had recourse to it, imagined it was attended with success."³⁸ In general, both as preventive of infection and as a means of rendering
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³⁸ Dr. Lind's Essays, p. 346.

the disease milder, every thing possible should be done to keep the room cool, and so ventilated as that whilst a constant succession of fresh to infected or foul air takes place, no current of it can immediately affect the person of the sick; and in addition to its freshness, no doubt much advantage will arise from saturating it with antiseptic particles; such as those which arise from boiling vinegar, burning camphire, and other substances of the same nature. I may here also mention the use of vitriolic æther, the evaporation of which in an infected atmosphere, may have an excellent effect in purifying it, and perhaps rendering healthy persons less obnoxious to the action of contagion. I have met with no writer who recommends this medicine as a prophylactic, but M. Poissonnier, “*Quand on considère que quelques onces d'éther peuvent répandre l'odeur la plus suave et la plus salutaire dans un très-grand hôpital sera-t-on arrêté par la dépense que cette prétendue profusion occasionera ! Si il est un cas où il soit beau d'être prodigue, c'est celui où l'on soulage les malheureux.*”³⁹

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³⁹ *Traité sur les Maladies des gens de Mer.* tom. I. p. 360.

But as, notwithstanding the justice and humanity of M. Poissonnier's observation, the expence attending the liberal use of æther in this way will be always an unsurmountable objection to it among the generality of mankind, I would recommend in lieu of it the æthereal oil.* Its smell is amazingly penetrating and permanent, and is highly antiseptic. The rubbing the bed-posts with a little of this, and sprinkling it on places most liable to receive and retain infection, would, I have no doubt, be infinitely beneficial.

Notwithstanding the evident necessity existing for the adopting a plan such as that I have proposed for the prevention of infection, and destroying it when it appears on ship-board, it is probable that the causes I have mentioned may always render the measure abortive. If therefore no proper places are chosen for the purpose of performing quarantine, and no lazarettoes are built, some other temporary expedient must be thought of in an emergency so pregnant with mischief. At the time the malignant pestilential fever began to rage on ship-
board,

* Oil of Wine.

board, and before it was communicated to the inhabitants, several expedients were proposed to stop its progress; but none were put in execution. Among these, I suggested to many of the captains, and some of the principal inhabitants, the following: The carenage or harbour is situated at the bottom of a very extensive bay, and so completely surrounded by land, as to be perfectly secure against every wind, except the S. W. which seldom blows. The opening into this fine bason is on the S. W. and is formed by two rocky promontories, on one of which Fort St. George stands; the other is private property, but perfectly barren, and so situated with respect to the inhabited part of the neighbouring country, as to be in a manner insulated. On this I proposed to have tents, formed of sails and spars, pitched, in which the sick from the different ships were to be lodged; temporary cooking places and privies were to be erected in the rear of the encampment; and proper nurses, and careful sensible negroes, as labourers, were to be employed. After landing and lodging the sick, such ships as had no part of their cargoes on board, were to

put

put in practice all the usual means of destroying infection ; and others were to do the same thing after re-landing the sugar and other produce they had taken on board. To prevent the spreading of the infection from this encampment, centinels were to be posted in such a manner as would effectually prevent stragglers from it or to it. It certainly requires no more than the simple description of the plan to shew its utility ; and, sure I am, had it been adopted, all the subsequent mortality and scenes of distress might have been altogether prevented.

During the prevalence of a pestilential fever, the great prophylactics are temperance in eating and drinking ; regularity in exercise ; the proper distribution of time with respect to sleep and watching ; attention to cleanliness of person ; and the avoiding such gratifications as have a tendency to weaken the vital powers. The words of Celsus in his “ Observatio in Pestilentia,” or fevers arising from marsh effluvia, are very comprehensive : “ vitare fatigationem, cruditatem, frigus, calorem, libidinem ; multoque magis se continere.” Whilst the pesti-

pestilential fever raged here, the utility of these means was remarkably illustrated by the almost total exemption of the French inhabitants from the disease. Their mode of living, compared to that of the English, is temperate and regular, in an uncommon degree; animal food and strong liquors are very moderately used by them; vegetables and small red-wine chiefly compose their diet; their passions are seldom excited to any degree bordering on excess; their minds seem in general tranquil, or actuated by a vivacity peculiar to themselves; and depression, or that state of the animal spirits they call Ennui, is never perceived to have place among them. The event too among the negroes, more especially those employed in the cultivation of plantations, affords another striking proof of the great benefit resulting from temperance during the existence of pestilence; for although it is probable that the negro race possess something constitutional which resists the action of contagion in a very great degree, still it must be admitted that their necessary temperance must have contributed much in the present instance to their exemption from

or to the mildness of the disease when it appeared among them. Many of the emigrants from the French islands, particularly Martinique, who from their unhappy situation could not accommodate themselves with their customary modes of living, and whose minds, suffering under the pressure of disappointment and deprivation of property, were subject to an unnatural depression of spirits: and some French prisoners, who, at this time, were obliged to live on salted animal food, and to use rum diluted for their drink, which articles composed the ration of provisions allowed them by government, did not enjoy the exemption their countrymen, inhabitants of the island, experienced. Many of the former, and all the latter had the disease; and many fell victims to it. Want of cleanliness and due ventilation could have little share in increasing the violence of the disease among the prisoners; for their confinement was limited to the extent of the ridge of Hospital-hill; from the purer air of which the 45th regiment had immediately before derived so much benefit.

THE following CASES, which have not, except two or three, been selected from many hundred, will perhaps illustrate the preceding History of the Malignant Pestilential Fever, and throw additional light on the mode of treatment I found most successful. The four first I have been favoured with by my partner Mr. William Campbell, a gentleman possessed of much ability, and diligence in the discharge of his professional duties. At the time they occurred I was confined with a violent attack of hepatitis; the most common, and, if not properly treated, the most dangerous endemic of the country. The first is inserted chiefly from the circumstance of its being the first which occurred.

CASE. I.

The carpenter of the ship Charlotte of London, Stephen Holman commander, was attacked in the night with the usual symptoms of fever, attended with pain in the eyes, which appeared very much inflamed and watery. He likewise complained of pain in the legs near where the gastrocnemii muscles join to form the tendo achillis. His stools were of a dark-green colour, and very offensive: were evacuated by means of a solution of salts and tartar-emetic; fourteen hours after which the fever was considerably abated. At bed-time, took a diaphoretic anodyne draught; on the following morning was entirely free from fever, and was ordered the bark every hour. In the evening was very low; his pulse small and quick; no febrile heat; his stomach rejected whatever he took; at bed-time had an opium pill, but passed a very bad night. On the following morning all the unfavourable symptoms were increased; the smell of his breath very offensive; and the irritability of stomach so great, that even opium

opium was rejected as soon as swallowed. Had him carried on shore, but was soon after seized with convulsions, and died in the course of the day. He passed no urine from the time he was taken ill till his death, and yet never complained of the smallest uneasiness from that cause.

CASE II.

21st March, 1793, went on board the ship Baillies, William Sym commander, to see John ——, one of the crew. Found him very low, his pulse pretty full, yet it could be stopped by the slightest compression; had no febrile heat; his eyes and skin were perfectly yellow; his stomach in such a state, that whatever he took was rejected immediately; complained of violent pain in the right side; a few spots of a dull purple colour were observable on his breast and shoulders; urine scanty, and of a pale-yellow colour. He said he was suddenly attacked, two days before I saw him, with violent headach, dimness of sight, and cold

shiver-

shivering, which were very soon after followed by convulsions that continued about two hours, as he was told ; for he was by no means sensible himself either of their presence or duration. Upon recovering from the convulsions, he found himself in a hot fever, with violent pains in the legs and eyes. These symptoms continued without any abatement till the end of thirty-six hours, although he was for the greater part of that time in a profuse perspiration. Being fully satisfied that his disease was the malignant fever, which prevailed at the time, and being at the same time well convinced that the common mode of practice in fever was by no means successful in this, I thought it necessary to try the effects of some medicines more powerful than those in common use ; and my choice in this instance was directed to mercury, for two reasons : the first was the evident presence of local affection ; the last, and perhaps the most cogent of the two, was its being strongly recommended by Dr. Chisholm ; in whose hands I had seen it productive of the happiest effects, in a variety of other diseases. The patient was accordingly ordered to take

a pill, composed of four grains of calomel and half a grain of opium, every four hours.

22d. The symptoms much the same; his stomach had frequently rejected the pills during the course of the day. Ordered to persist in their use.

23d. In the morning the symptoms the same as on the preceding day; but towards evening, the uneasiness at the stomach had greatly abated, and he had rejected only one of the pills during the whole day. Ordered to continue the use of the pills.

24th. About noon the mercury had evidently affected his mouth, and he was spitting plentifully. He complained of nothing now but weakness, every other symptom of the disease had disappeared excepting the yellow colour of his skin and eyes, which went off gradually. By the use of fresh diet and a little wine, he was able to do his duty in the ship in the course of eight days. He had taken, before his mouth was affected, about 48 grains of calomel.

CASE III.

April 10. Stephen —, of the ship Baillies, a lad about seventeen years of age, was suddenly seized about noon with convulsions, which lasted about an hour and an half. When he began to recover, complained much of pain in the legs, back, head, and eyes, the latter of which were remarkably inflamed and watery: his pulse very quick and hard; his skin, although at the time in a profuse perspiration, felt very hot, and on withdrawing the hand after touching it, a sense of heat remained in the points of the fingers for some time; was evacuated by a solution of salts and tartar emetic. Towards evening the fever began to go off, but was succeeded in the night by coma to such a degree, that at eight o'clock on the morning of the 11th, every attempt to rouse him or make him take any thing was ineffectual. At that time respiration was laborious; and his breath was so offensive, that one could smell it at the distance of two or three yards.

yards. Was again attacked with convulsions about two o'clock P. M. which carried him off in a very short time.

CASE IV.

May 9. Mr. Taylor, mate of the ship Charlotte, was attacked about nine o'clock in the morning with the usual symptoms of the malignant fever: was evacuated by means of pills composed of calomel, jalap, and cath. extract, taking at the same time a wine-glaſſful every hour of a solution of salts and tartar-emetic, which operated freely. In the evening the fever had not abated in the ſmallest degree, although he was in a continual free perspiration the whole day. Continued during the night to take the ſaline mixture, with the addition of ſome ſpirit vitriol. dulc.

10th. In the morning the fever partly gone off, but complained of great uneasiness at ſtomach; pain in the right ſide, eyes, legs, and back; little or no headache; frequent

quent vomiting and purging; what he voided by stool had much the appearance of boiled greens beat into a pulp with water, and the smell very offensive. Took, during the day, the saline mixture, and every four hours a pill of calomel, opium, and antimonial powder. In the evening, symptoms much the same, with some appearance of delirium, without however any degree of febrile heat, or quickness of the pulse.

11th. Had been delirious all night, but was in the morning perfectly collected; no fever; pain of the side much the same; considerable difficulty in breathing; had passed for the first time since the commencement of his disease, about two ounces of urine, of a pale yellow colour, and perfectly transparent. Ordered to continue the calomel pills alone. Towards evening, began again to be delirious, and continued so the greater part of the night.

12th. Eight o'clock, A. M. his breathing more affected than on the preceding day, and exceedingly restless; he said he felt as if about to be suffocated, if he continued
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for any length of time in one position ; the smell from his breath and body remarkably strong and offensive ; at noon, his mouth began to show signs of being affected by the mercury ; the pain in his side was now not so violent ; the oppression in breathing much less ; could lie in any position for a length of time without much uneasiness. In the evening was spitting freely, and free from every complaint but weakness ; passed a good night, and in the course of a week, by the use of wine and nourishing food, was able to do his duty in the ship.

CASE V.

June 10, 1793, Thomas Smith, a gunner of the royal artillery, was admitted into the hospital with the usual symptoms of the malignant pestilential fever, which had seized him the preceding evening, in a very sudden manner. A solution of salts and tartar emetic was immediately given ; but not having operated well, on the 11th he had a bolus of ten grains of calomel, fol-

followed up by a brisk purge of jalap. By means of these, the symptoms having considerably abated, he began the use of the Peruvian bark on the 12th. In the evening of that day, however, he was suddenly seized with delirium, and in the night-time, taking advantage of the quiet in the hospital, he stole out, and walked to the barracks, at least a mile distance; in which the commanding officer, imagining he was intoxicated, had him confined. On being brought back the following morning, he had every appearance of fatuity, low fever, cold clammy sweats, dilated pupils, and staring eyes. With the utmost difficulty the assistants could keep him confined to bed. After having his head shaved, I had a large blister applied to it, and one to the inside of each thigh, and ordered six grains of calomel, without opium, to be given to him every four hours.

14th. Blisters rose well; the calomel gave him several small stools; urine scanty and bloody; a yellow suffusion has begun to appear on his neck and breast; still fatigued. The blisters to be dressed with blistering

tering ointment, and eighteen grains of calomel, with two of opium, to be given twice in the day.

15th. Much less deranged ; yellow suffusion increased ; urine very scanty ; no appearance of ptyalism. The calomel to be repeated as yesterday ; and to have a tea-spoonful of sweet spirit of nitre every two hours, till the symptoms of strangury abate. In the evening, fatuity pretty much gone ; mouth a little affected ; pulse remarkably small and quick, but soft ; other symptoms as in the morning, only much general prostration of strength. Ordered a large tea-spoonful of bark in a glass of Port-wine every hour ; to have every third hour a tea-spoonful of vitriolic æther in a little cold water ; and, should his stomach reject the bark, to have it by injection.

16th. Fatuity totally gone ; soreness of his mouth much the same ; skin warmer, and pulse fuller, and more natural ; yellow suffusion less ; stomach retentive ; has taken seven doses of bark in wine, and thrice of the æther. Continue bark, wine, and æther.

17th. Soreness of his mouth much increased; pulse, preceding evening, extremely feeble and small. To-day much as yesterday. Has taken three pints of wine since last night. Continue.

18th. Much better; salivation troublesome; an ounce of salts.

23d. Convalescent; and, July 11, discharged.

CASE VI.

June 13, 1793. Robert Mackay, gunner in the royal artillery, admitted into the hospital with the usual symptoms of the malignant pestilential fever; had a solution of salts and tartar-emetic.

14th. The solution having operated well, took every three hours the following powder;

R Nitri pulv. 3i.

Calomel pp. gr. iiij.

Camphor, gr. iv. M.

15th. The powders occasioning irritability of the stomach, a pill was substituted of five grains of calomel, and a grain and a half of opium.

16th. Notwithstanding the use of the pills, which agreed well with him, the more untoward symptoms, coma, low delirium at times, cold clammy sweats came on so rapidly, as to induce me to discontinue the calomel all this day and the following, and to give bark and wine. These, however, had no effect; his state seemed desperate; and perceiving, with the symptoms mentioned, the dilatation of the pupils, I had again recourse to the calomel on the

18th. And ordered blisters to the thighs and the stomach. During all this day he took twenty grains without effect; nor were the blisters of the smallest use, although they rose remarkably well.

19th. In the same state; if any change it is for the worse. Ordered eight grains of calomel every three hours; and, should it purge, thirty drops of laudanum to be given

given to him, from time to time, till the purging ceases. Bark and wine, at the same time, to be given as liberally as possible. In the evening, matters becoming worse, ordered sixteen grains of calomel to be given at one dose. The quantity taken, including this to-day, forty grains.

20th. The same. Fifty grains of calomel to be given at three times, with opium.

21st. In addition to the calomel, I now ordered as much spiced Port-wine, and bark and Port-wine, to be given to him as he could possibly take.

22d. Still the same. Took fifty-four grains of calomel, and four pints of spiced wine yesterday.

23d. As he still continued in the same state, and as a black fur had formed on his teeth, gums, and tongue, I was afraid to push the calomel any further. He had already taken 254 grains without its purging him, and without showing any disposition to act on the salivary glands. I therefore now left him to Nature, only endeavouring

vouring to assist her by the plentiful use of spiced wine, and bark and wine. In this state he continued till about noon of the 24th, when a gentle spitting came on, which, however, disappeared about midnight. With a view to encourage and bring on the salivation, I had his head well wrapped in flannel; and his neck and jaws frequently anointed with warm camphorated oil; and he still continued the bark and spiced wine. By means of these, a gentle salivation was again brought on, and continued till the third of July, when carbuncles broke out all over his body, particularly in the most fleshy parts: some of these were as large as a small pullet's egg; but in general they were of the size of a pigeon's egg. Those of them which opened naturally were dressed with digestive ointment, and the others had a poultice applied to them. From this time he continued to recover; but it was not before the second of August he could be discharged.

CASE VII.

June 9, 1793. John Chevers, a gunner in the royal artillery, of a weakly constitution, and a taylor by trade, was admitted into the hospital for the malignant pestilential fever, after the inflammatory stage had passed: he still, however, complained of violent pain in his right side. For this, he had a blister applied; the nitrous powders with calomel; and, now and then, bark and Port-wine, if his stomach could bear them.

11th. His stomach rejected all these: and the putrescent stage came on with most of the worst symptoms, particularly coma and cold clammy sweats, with deadly coldness of the surface. Irritability of the stomach disabled him from taking any of the medicines hitherto used in this disease; I therefore directed twenty drops of æther to be given to him four times in the day, in a little cold water.

12th. The same. The æther to be doubled ; and if his stomach can receive them, to have nourishing food and wine. He continued the æther alone all the 13th, 14th, and 15th, when the dangerous symptoms disappeared : his stomach became retentive ; and on the fifth of July he was discharged.

CASE VIII.

July 12, 1793. John Gibson a gunner in the royal artillery, lately arrived from Europe, was admitted into the hospital, labouring under all the symptoms of the malignant pestilential fever in a very violent degree. Had a solution of salts and tartar-emetic.

13th. The solution having operated well, he immediately began the use of the calomel.

14th. Much as yesterday, only lower ; and the calomel seems inclined to affect his

his bowels. Ordered a grain of opium every two hours, should the purging increase, and to have in the course of the day an ounce and an half of bark.

15th. Slight foreneis of the mouth, pains, &c. relieved; but coldness of the surface, and some degree of clamminess have come on. Continue the medicines.

16th. Much inclined to coma; ptyalism very moderate. Ordered to have two ounces of bark mixed in a bottle of Port-wine, in the course of the day.

17th. The purging returned, and more frequent than before; ptyalism much abated; much irritability of the stomach; coma; and a tendency to delirium; clamminess and coldness of the surface. Ordered two grains of opium every two hours till the purging ceases. The bark and wine as yesterday; and æther, from time to time, till the stomach becomes retentive.

18th. The purging ceased after taking a few pills of opium; ptyalism increased; but
the

the stomach still irritable. Continue bark, wine, and æther.

19th. Much better. Ordered to continue the bark and wine, and to have a small basin of fago frequently. From this time he continued to recover; and was on the second of August discharged.

CASE IX.

Duncan Ross, a bombardier in the royal artillery, aged about thirty-seven, of a remarkably robust person, and strong constitution, was seized with all the usual symptoms of the malignant pestilential fever on the 22d of July, but was not reported till 25th, when he was admitted into the hospital. Complained of most violent pain in the forehead, back, calves of the legs, and right side, with very full and quick pulse, ardent heat of the surface, staring inflamed eyes, and considerable irritability of the stomach. Before his admission he had taken some salts without my knowledge. He immediately

diateley began to take calomel; of which, in the course of the 25th, he took twenty grains, with a proportionate quantity of opium and James's powder. In the evening the symptoms were so unfavourable, that I judged it necessary to administer bark-injections every third hour.

26th. Much the same. Ordered the medicines as yesterday.

27th. Irritability of the stomach much increased. Continued the medicines as before, and ordered to have a tea-spoonful of æther in water, from time to time, till the vomiting abates.

28th and 29th. The same. No appearance of ptyalism, although he had taken 130 grains of calomel.

30th. Became comatose; frequently delirious; and made violent exertions to get out of bed. His skin, which had acquired on the 28th the livid disagreeable colour constantly observed in the bad cases of the fever, became now in several places of a

much darker hue; vibices began to appear about the neck; a hemorrhage, amounting to a quart, came on last night; has still frequent large discharges from the nose; irritability of the stomach so great as to resist every means I could devise to allay it, particularly large quantities of æther. I now gave up every thought of pushing the mercury further, and depended solely on the bark-injections, which were repeated every two hours.

31st. The same. Lost two quarts of blood last night; vibices increasing. Continue.

August 1. Hemorrhage still continues; had discharged by stool a very considerable quantity; from the nose also; and the blood had now become so extremely putrid and offensive, as to keep the nurse and assistants at a considerable distance from the patient. Died early this morning.

CASE X.

James Knowles, a recruit of the royal artillery, young, spare made, but of a florid complexion and strong constitution, was admitted into the hospital the 25th July, on which day the malignant pestilential fever seized him. It came on with strong convulsions, which was succeeded by the usual symptoms in the most violent degree. On his admission he had the solution of salts and tartar-emetic, which operating well, he took, on the morning of the 26th, a pill of five grains of calomel, and one and a half of opium ; the calomel was repeated every three hours ; and as there was much irritability of the stomach, a large blister was applied to the epigastric region.

27th. Tendency to coma and delirium ; most ardent heat and dry skin ; of a colour much inclining to livid ; the quantity of calomel doubled ; and, as what he had already taken had purged him, ordered a grain of opium every three or four hours to check it.

28th. Continual vomiting, coma, and delirium; the latter more violent than usual attended with continual sobbing, sighing, and shedding of tears. Former scenes were continually presented to his imagination; and, as if in the midst of his domestic friends, he related the circumstances, but with much incoherency. It was remarkable, that although all these were related in a most desultory, unconnected manner, and with a total forgetfulness of the place or situation he then was in, they excited piercing lamentations, and a profuse discharge of tears; and if for a moment he happened to recollect himself, he bitterly accused himself of folly, in a disposition strongly composed of gaiety, or seeming gaiety, and the deepest melancholy. During this dreadful scene, which I was unfortunately a witness to, he frequently made most violent attempts to get out of bed; and on being prevented by the assistants, he upbraided them for their cruelty, in the names of his friends or former companions. Towards evening he had several convulsive paroxysms, in one of which he expired; completing exactly seventy-two hours.

CASE

CASE XI.

In the following singular case, almost all the methods of cure described in the foregoing sheets were used, as indications arose. In its commencement it betrayed no marked malignity, or uncommon violence; but in its progress, the disease acquired the utmost degree of virulence, in so much as to induce me to expect to hear of the patient's death every morning on visiting the hospital. It is singular also for being the last which occurred of the malignant pestilential fever.

September 9th. Thomas Smith, a second gunner of the royal artillery, was admitted into the hospital, labouring under the usual symptoms of the prevailing epidemic in the second degree of violence; had the solution of salts and tartar-emetic, which operating well, was followed up on the 10th with the saline draughts, and a proportion of spt. nitri dulc. The symptoms, however, not yielding to this, he began in the evening the use of calomel.

R. Calomel ppt. gr. v.

Pulv. Jacob. gr. ij.

Opii, gr. i. M. f. pilula tertia quaque h. s.

Together with these, on the 11th he took 20 grains of Angustura bark every hour, mixed with water.

12th. The symptoms, particularly the pains, having abated, the pills were discontinued; but he took every hour the Angustura bark, as before.

13th. Worse. Two of the pills to be taken thrice in the day; the Angustura bark as before, and a laxative injection in the evening, being rather costive.

14th. The same. Three pills to be taken thrice in the day; the Angustura bark as yesterday; and if he has no stool before noon, a laxative injection is to be administered.

15th. The same. Eighteen grains of calomel and two of opium, thrice in the day;

day ; two ounces of Angustura bark during the day ; an injection as yesterday ; and spiced wine from time to time.

16th. Had 76 grains of calomel since yesterday morning ; the last 20 without opium ; in consequence of which, he had two stools. Thinks his mouth is rather sore ; turbid brown urine ; brown parched tongue, and black furred teeth and fauces. Deep yellow suffusion since the afternoon of the 14th, interspersed with *petechical* spots, and vibices on the neck ; perfectly collected. A blister that was applied to the head, and one to the inside of each thigh, in the evening of yesterday, rose well ; but during the night delirious at times ; at present coma and clamminess of the surface, although pulse 100. and pretty full, with some degree of hardness. Took very little bark yesterday. Ordered, to have immediately 20 grains of calomel without opium. At noon, the same quantity to be repeated ; and if a purging should come on, to check it with a grain of opium from time to time. The Angustura bark as yesterday. In the evening, still comatose ; at no times delirious ; had

40 grains of calomel, which having brought on a purging, two grains of opium were given every two hours to check it; which had the effect after six were taken. In every respect as in the morning; urine turbid; no calomel; but injections composed of two ounces of Peruvian bark, with a sufficiency of Port-wine to render it fluid, and two tea-spoonfuls of laudanum to be administered every two hours.

17th. In the course of the night sometimes delirious; calm and collected at present, but coma and clamminess of the surface still continue. Yellow suffusion of a deeper hue; and the serous discharge from the blisters, as well as the urine, of the same colour. Had five injections since the evening of yesterday, each composed of two ounces of bark and half a pint of Port-wine, and a tea-spoonful of laudanum; urine turbid, but has deposited a small sediment of a granulous texture, and whitish colour. Ordered the bark injections, the Angustura bark, and spiced wine. In the evening, had five injections since morning, three of which were immediately passed; his stomach, however,

ever, has been remarkably retentive, so that he has taken more than an ounce of the Angustura bark. In the afternoon, the delirium increased very much; and at that time he made several violent exertions to get out of bed, and was so affected at the resistance made to them, that he called out Murder, and expressed otherwise great perturbation of mind. He appears, however, at present calm, and as collected as in the morning. Remarkably deaf; which he is himself sensible of. In the course of the day, marks of subsultus tendinum; which have now disappeared: pulse 112; warm moisture on the surface, without clamminess; comatose; lies chiefly on his back, with his eyes open. Ordered the injections, with a double quantity of laudanum, and a larger quantity of the Angustura bark.

18th. Had only three injections in the course of the night, and they were administered with considerable difficulty, owing to his prejudice against them; stomach very retentive, has taken two ounces of Angustura bark since last night. Having a strong

inclination for rum and water, he was deceived, by being told the dose of Angustura bark was grog. In the night-time, made only one attempt to get out of bed; and had much less delirium than usual. Still comatose, however, on being called to, seems perfectly sensible of his situation; no pain; no subsultus tendinum; and surface warm, and covered with warm moisture, nowise clammy; deafness continues; pulse 104. Ordered to have, from time to time, a little rum and water; to continue the injections; and the Angustura bark in as large quantity as possible. In the evening had three injections, but passed them almost immediately. Took an ounce and an half of Angustura bark. Symptoms much as before: pulse 102; when offered the diluted rum, tho' only the full of a common wine-glass, he expressed his satisfaction by saying, "it is glorious." Continue medicines.

19th. Had only two injections during the night; would not permit any more to be given; has taken more than an ounce of Angustura bark; no delirium, but comatose. Some appearance of the hippocratic countenance

nance to-day ; thick black fur on his tongue, which impedes his speech much : moisture, heat, &c. as last night ; sleep more natural, and lies on his side, which he has not done hitherto ; urine very turbid, and of a brownish colour, inclining to green, without any deposition of sediment ; pulse 104. Had a gill and half of rum diluted in water during the night. Continue the medicines as before. In the evening, had only two injections, which were kept. Having ordered equal parts of Peruvian and Angustura bark to be given by the mouth, instead of the latter alone, two doses were given, but owing to the taste of the former, which he was instantly sensible of, or to the peculiar dislike always manifested in this fever to it, he vomited them up almost immediately ; eat a good deal of beef-soup, and some meat, both of which he called for. Symptoms much as before ; takes the rum and water greedily. Continue the injections, and Angustura bark alone.

20th. Had three injections ; one ounce and half of Angustura bark, and about a gill of rum diluted. Symptoms as yesterday.

Slept

Slept a little; pulse 96; urine very turbid, and of a deep brown or porter-colour, with several clouds of the same colour floating near the bottom of the glafs. Stools, of which he has one generally in the twenty-four hours, are not fœtid.

21st. Since yesterday morning had six injections, and two ounces of Angustura bark; and last night took some oatmeal-gruel and wine; pulse 108. Symptoms pretty much as before. In the evening, much more sensible than he has been at any time since the commencement of the fever. Tongue free of black fur, but still dry; fur on the teeth and fauces gone also. Has expressed a wish to have the injections discontinued, as he thinks he can take the Peruvian bark and wine by the mouth. Ordered to continue the injections, Angustura bark, nourishment, and diluted rum.

22d. Much the same as yesterday, only pulse 112. Continue medicines, &c.

23d. Countenance rather clearer, and eyes seem less dull and heavy; tongue still brownish,

brownish, and to-day cracked, with, near its extremity, something like brownish coloured pus; pulse 110. Continue medicines, &c.

24th. Rather more of the cadaverous smell to-day than usual; other symptoms nearly as before. Pulse however seems to quicken, and at the same time to diminish in strength and fulness; to-day it is remarkably feeble, almost thready, and 114 in a minute. Had no injections last night, as he took the Peruvian bark and wine by the mouth. Continue.

25th. Pulse 108, and more feeble and thready than yesterday; perfectly sensible, but debility increased to an extreme degree. Took in the course of the night almost a bottle of wine, and two ounces of Peruvian bark. In the evening, having continued to take the Peruvian bark and wine very liberally during the day, for the first time complained of ptyalitic symptoms. On offering him some soup, he immediately complained of its occasioning a most unusual heat and pain throughout the whole of his mouth

mouth and throat ; and even rum and water, which hitherto he preferred to any thing else, he has refused, not from dislike, but from the pain the swallowing it brought on. More sensible than ever. Continue the bark, wine, and nourishment.

26th. Lower to-day than usual, although he took in the course of the night a bottle of wine, and two ounces of bark ; pulse much more feeble and thready, and evidently tremulous ; 112 in a minute. Soreness continues, but nothing like spitting. Continue medicines, &c.

27th. Pulse 120, feeble and tremulous ; tongue for the first time clean and moist ; urine less turbid, and more of the colour of fined porter ; and has precipitated a considerable sediment, of a yellowish colour. Soreness rather increased ; takes much nourishment, and a large quantity of wine and bark. Continue medicines, &c.

28th. Pulse remarkably indistinct, and so small as scarcely to be felt ; it appears to be

be about 96; otherwise much as yesterday.
Continue medicines, &c.

29th. Pulse 116; more distinct than yesterday; feeble, but not thready; skin, at length, soft and agreeably cool; has now recovered in a great measure his natural tone of voice, which hitherto has been low, shrill, and drawling. Appetite increased much. Soreness of his mouth much as on the 27th, with now a very moderate spitting. Continue medicines, &c.

30th. Pulse 116, perfectly distinct, but still rather weak and small; soft skin, and otherwise, as before. Continue medicines, &c.

October 2. Pulse 112; good appetite; clear skin and eyes; tongue moist.

3d. Pulse 100. Continues to recover; complains much of his mouth: no bark; but continue wine and nourishment.

From this time he continued recovering till November 2, when he had acquired so much strength as to be able to quit the hospital and do his duty.

Many

Many other cases similar to these might be added ; but as they contain only a repetition of the same circumstances, their insertion would be unnecessarily occupying the time of the reader. The Angustura bark being however, a new medicine, and the exhibition of it in malignant fevers having been, I believe, till now unattempted, I shall add a few cases of the malignant pestilential fever, in which it was the sole or the principal medicine used, after the operation of the usual evacuants.

CASE XII.

Joshua Smith, a gunner in the royal artillery, just arrived from England, a man of a strong constitution, aged 27, was admitted on the 23d of July into the royal artillery hospital for a dysentery ; the symptoms of which rather unexpectedly disappearing, he was seized on the 27th with the usual symptoms of the prevailing epidemic. A vomit of tartar-emetic was immediately given

given, and followed up with saline draughts, charged with spt. nitri dulc.

28th. Much the same. Continue the draughts every hour till cooler, when he is to have bark and wine.

29th. Symptoms increasing; the scrotum particularly affected; and, on examination, found the testicles drawn up towards the abdominal ring, and the penis contracted and distorted. Ordered a pill of five grains of calomel, two of James's powder, and one of opium, every third hour.

30th. The pills having occasioned irritability of stomach and purging, were discontinued; and bark and wine, in as large quantity as possible, substituted in their room.

31st. The symptoms continue, with the addition of coma and occasional delirium, with clammy sweats. The medicines hitherto used having disagreed with him, particularly the pills and wine, I now or-

dered the bark to be given in the following form, as frequently as possible:

B. Pulv. cort. Peruv. $\frac{3}{i}$.

Flor. sulphur. $\frac{3}{i}$.

Aq. cinamom. spirit. $\frac{3}{iv}$.

— — simp. $\frac{3}{x}$. M.

and every two hours a pill of three grains of camphor. In the evening, however, the irritability of stomach so much increased, as in some measure to preclude the use of these medicines. I therefore directed a bark injection, made with tepid water, to be administered every third hour, till the stomach became retentive.

August 1. Irritability lessened, and able to take the above medicines.

2d. Very low ; irritability has again returned ; much low delirium ; scrotum ulcerated, and discharging a most foetid ichor. The bark injections to be renewed, and the other medicines to be taken occasionally.

3d. Continued in the same state. Removed into another ward. Continue the injections of bark.

4th. Much lower, and frequently insensible; at other times made violent exertions to get out of bed; very delirious. What had hitherto been done having produced no effect, I determined to-day on giving him the Angustura bark, without much expectation of his deriving benefit from it, but to satisfy myself that nothing had been left untried. He accordingly took twenty grains in water every two hours.

5th. I examined the state of his urine to-day; it was clear, and of the colour of brandy, without any sediment or cloud; great thirst; parched tongue and fauces, and of a brownish colour. Continue the Angustura bark.

6th, 7th, 8th. The same. Has uniformly retained the Angustura bark.

9th. Urine very turbid, with whitish sediment. Continue.

10th, 11th. Free of coma; no delirium; skin agreeably cool and moist; tongue moist; no thirst.

From

From this time he continued to recover; and on the 6th of September discharged, fit for duty.

CASE XIII.

Henry M'Kendry, a young man of a florid complexion and small stature, was seized with the symptoms of the pestilential fever on the morning of the 7th of August, had lately arrived from England, and been once troubled with slight symptoms of dysentery since his arrival; had taken a vomit of 20 grains of ipecacuanha, and one of emetic-tartar, immediately after the symptoms of the fever appeared; and, after its operation, began the use of the Angustura bark; the discharge from the stomach consisted of at least two quarts of poracious bile, which emitted a most offensive smell; the vomit also operated by stool several times, which discharge was likewise very foetid. Before the morning of the 8th, he took fully an ounce of the Angustura bark, at which time most of the symptoms had disappeared,

par-

particularly the headach and nausea. On the 8th, and the following night, he took two ounces of the bark; and on the 9th felt himself considerably better. His urine on this day was of a deep brandy-colour, and precipitated a considerable quantity of whitish sediment. He continued the use of the Angustura bark till the 13th, when appetite, and other signs of returning health, were so evident as to render the further administration of medicines unnecessary. In a very short time after, he was perfectly recovered.

CASE XIV.

Robert Mill, a bombardier of the royal artillery, was on the 14th of August seized with pain in the forehead, sinciput, and temples, with the other usual symptoms of the prevailing epidemic, which in the evening increased to a very alarming height; cold sweats, irritability of stomach, and tendency to coma, with the staring prominent eye. For these he took in the afternoon an emetic

tic of ipecacuanha and the antimonial; and late in the evening, he began to take the Angustura bark.

15th. General symptoms considerably abated; irritability of stomach almost gone; took upwards of two ounces in the course of the night and morning of the Angustura bark. Ordered to continue the Angustura bark with, occasionally, a small addition of thebaic tincture.

16th. Complaints almost gone; urine very dark-coloured, almost similar to a strong infusion of tobacco, and turbid, with a considerable deposition of whitish sediment in small cakes. Continue the Angustura bark as yesterday.

17th, 18th. Continuing better, and return of appetite.

I shall beg leave to make an observation here, which I neglected in its proper place. A few drops of thebaic tincture will always be a good addition to either the Peruvian or Angustura bark; for as the nervous system
is

is very much affected in the malignant pestilential fever, this, as an antispasmodic, will be found a most useful medicine; and given, mixed with the antiseptic, will have the double advantage of quieting the general irregular motions of the nerves, and of acting on the stomach in such a manner as to enable it to retain the medicine with which it is combined. Solid opium has in no instance I have met with, acted with equal efficacy. Whether it is, that the opium has been discharged before any part of it could be dissolved; or, that the tone of the stomach and intestines being suspended, it has passed off without their being affected by it.

I shall conclude with a Case in which very large quantities of the Angustura bark always retained, had not the least effect in preventing a fatal termination.

CASE XV.

Lieutenant Watkins of the royal artillery, a young gentleman of a strong robust make and

and constitution, aged 25, on the evening of the 29th of August, a few days after his arrival on the island, was seized with all the usual symptoms of the malignant pestilential fever in the more violent degree. This gentleman had heard before his arrival of the dreadful devastation committed by this disease; and knew that three other officers, who had some time before crossed the Atlantic in the same ship with him, had fallen sacrifices to it in the very house in which he was then quartered. These circumstances had impressed him with a just dread of the evil he had much reason to expect, and no doubt added very considerably to the natural violence of the symptoms. After being well evacuated by means of a vomit of ipecacuanha and tartar-emetic, and a solution of salts and tartar-emetic, and a profuse diaphoresis having broken out by noon of the 30th, he began the Angustura bark in doses of a scruple, repeated every hour. The two first he retained; but afterwards, the instant the bark reached the stomach, it was rejected. During the remainder of this day, all the 31st, and greatest part of the 1st of September, the irritability continued.

Neither

Neither medicine nor nourishment could be retained ; his skin became dry, his tongue and fauces parched, the former of a brownish colour ; a weakening discharge by stool came on, of a most foetid smell and blackish colour. I gave him calomel joined to solid opium all the 31st ; but this passing off by stool, increased the general weakness, without a possibility of its acting on the salivary glands. He now again tried the Angustura bark, but in vain ; and as nothing else could be at all effectual in stopping the progress of the disease, I determined to persevere in it, in hopes of its being at length wholly retained, or at least such a portion of it as might be sufficient to prevent gangrene. In the night-time, he himself proposed that this bark should be mixed in some strong wine or spirit, which might prevent its rejection. Capt. D'Arcy, of the same corps, who carefully attended him, luckily recollect ed that he had by him some infusion of Peruvian bark in Port-wine, that had been made upwards of a month before ; and of this he gave Mr. Watkins an half wine-glassful, and repeated it at the end of two hours. Its effect was astonishing ; for

when, at the expiration of two hours more, a dose of Angustura bark in water, with ten drops of laudanum, was given, he swallowed it without disgust, and kept it. From this time he continued the Angustura bark with the laudanum, and, retaining it, was, when I saw him on the 2d about noon, by which time he had taken and retained twelve doses, totally free from fever; easy in every respect; his skin agreeably cool, with a general warm moisture on it; the staring prominence and redness of his eyes had almost entirely disappeared. In short, he seemed now to be in a fair way of recovery, although the preceding day I had formed the most unfavourable prognostic of his situation; but alas! how flattering was all this! On visiting him on the 3d, I found a change had taken place in the night; he suddenly became delirious, the protrusion and staring of his eyes returned, every muscle was affected with tremor; but his skin continued cool, and his stomach still retained the Angustura bark. When I saw him he was nearly in this state, only the coolness of the skin was attended with a clammy moisture. Together with the bark,

which

which he took and retained remarkably well, I ordered a large blister to be applied between the shoulders, chiefly with a view to overcome, if possible, the general spasm.

4th. During the night the delirium increased much, and alternated with coma ; the muscular spasm was much more violent ; the surface of his body was cold and clammy, and some vibices appeared on the neck. The blister rose remarkably well, and his stomach continued remarkably retentive ; this was his state, with the addition of insensibility, when I saw him near noon. A curious circumstance (observed by the attendants frequently, and by myself once) was the rapid change and alternate succession of colour of the skin, from very pale to dingy, or livid, or to bright yellow ; these succeeded each other in the space of a few minutes ; at the end of which, his skin became of the usual dirty, livid hue, peculiar to the complaint. An hour after, the alternate succession would come on again ; and after continuing the same length of time, would be succeeded by the livid colour, and so on. About four in the afternoon,

noon, a violent convulsion came on, and continued a few minutes; his respiration became now extremely oppressed, and he frequently, as if by a natural impulse, laid his hand across the pit of the stomach; the muscular spasm now increased so much as to shake the bed with much violence. About six o'clock, another violent convulsion carried him off. During the two last days he took upwards of three ounces of the Angustura bark, and fully three bottles of Port-wine, with a good deal of nourishment, which indeed he generally had a craving for.

AFTER

AFTER finishing the foregoing little ESSAY, it was not my intention to add any thing further on the subject. Since then, however, so many aditonal, and if possible more powerful, proofs have occurred of the superior efficacy of the Mercurial Treatment in the Malignant Pestilential Fever, that I should consider myself as acting unjustly to the Public, as well as wanting in humanity, did I withhold a short account of them, by way of Postscript to what I have already written.

THE year 1794, whilst it unhappily produced many hundred instances of the malignant pestilential fever in Grenada, also afforded the most unequivocal proofs of the superior efficacy of mercury in the treatment of that dreadful malady. Although in one instance the disease was evidently introduced by an American vessel from Martinico, in the month of February; and in another, by an English trader from the same island, after its capture, yet it is highly probable, that, from the causes I have mentioned, the town of St. George has been at no time since the first introduction of the disease by the Hankey, in February, 1793, intirely clear of the infection; the rum-shops having been a never-failing receptacle of it. The want of subjects to act on, might suspend the operation of the contagion for a time; but the arrival of strangers, to whom it has uniformly been deleterious, gave life to its seeds, which had hitherto been concealed, not destroyed.

As it formerly not unfrequently happened, from the necessary timidity a practitioner feels who adopts a new remedy in the treatment of one of the most dangerous and destructive maladies the human frame is subject to, that that remedy was not always pushed to the length which secures its efficacy; so on the reappearance of the disease, I was determined to give the calomel earlier, and in much greater quantity than the preceding year. Accordingly, instead of preceding the administration of this excellent remedy with the usual evacuating medicines, I began with it, and continued it without the interposition of any other, till salivation took place. The success attending this practice exceeded my most sanguine expectation; so great indeed was it, that I did not lose a single patient in whose case it was pushed to the full extent. My practice will, no doubt, by many be considered as unwarrantably bold; but as its wonderful success has been experienced by several other practitioners, who can bear testimony to it, I feel not the smallest hesitation in recommending it with all the fervor which an earnest wish to save the lives of men,

men, and the fullest conviction of, I am almost inclined to say, its infallibility, can give rise to.

My mode of using the calomel since the reappearance of the disease, is to give ten grains to an adult patient as soon as possible after I see him. This generally acts as an aperient in the degree required, about an hour or two after it is given. At the end of three hours I repeat the same dose without opium, if the first had not purged more than twice. At the end of three hours more, the same quantity is given, adding opium or not, as the preceding doses have acted. In this manner ten grains are given every three hours till the salivary glands become affected; which generally happens in less than twenty-four hours from the commencement of the treatment. The effect of the medicine given in this manner, may be perceived after the third dose in general; the patient becoming calmer, less restless, less anxious; his skin being softer, and possessed of an agreeable heat; the stomach being perfectly retentive, however irritable it might have been

been before ; and the eyes recovering their former lustre and sensibility. When, at length, salivation takes place, the patient is left free from disease, with a moderate warm moisture on his skin ; and very soon after, signs of returning health are indicated by calls for food, &c. The recovery of strength is proportionally rapid to that from disease ; nor is it at all necessary to have recourse to bark, or any other medicine whatsoever : a circumstance truly gratifying both to the patient and physician, in a disease wherein Nature revolts at the very idea of it. In fact, calomel is the only medicine, except the occasional addition of opium, I have latterly given ; of course the practice has been as simple as it has been efficacious : an additional encouragement to the practitioner, and to those whose situation may render them liable to receive the pestilential infection.

On my way to Europe, in the month of July last, I was detained a month at St. Christopher's, waiting for convoy. During that time, I had frequent opportunities of conversing on the malignant pestilential

fever with some ingenious and eminent practitioners of that island; who informed me, that the want of success they experienced in the various modes of treatment they adopted during the prevalence of that epidemic, in the latter months of 1793, made them dread a second visit of it as the greatest calamity that could befall the colony. At this time the arrival of a ship at Basseterre from Martinico, with the malignant pestilential fever on board, gave me an opportunity of displaying the efficacy of the mercurial treatment; which had never before been thought or heard of there. Dr. Armstrong, who to the most pleasing manners of a gentleman adds uncommon medical ability, and the candor which always accompanies both, attended the sick on board this vessel. The first patient was a strong, robust man, some time before arrived from Europe, and who had the further disadvantage of having been three days ill before medical assistance could be called in. The worst symptoms had already appeared; such as continual vomiting, coma, and the delirium peculiar to the disease. The Doctor, by my advice, began with ten grains of calo-

calomel, and repeated it without opium, as it did not purge, every three hours. To his astonishment, and contrary to the prognostic of the other medical gentlemen to whom he communicated the case, a salivation coming on before the expiration of twenty-four hours, the usual signs of returning health immediately after succeeded.

Since my arrival in England, I have had peculiar satisfaction in finding that a treatment nearly similar to the above had been adopted with great success in the malignant pestilential fever, which so fatally prevailed at Philadelphia during the autumn of 1793. Dr. Rush's medical talents and merit are too well known and too generally acknowledged to require the feeble efforts of my pen to extol them. If any thing, however, could add to the excellence of this gentleman's character, it must be his benevolent exertion, and unwearied perseverance during the existence of this dreadful calamity, in relieving his helpless and afflicted fellow-citizens, and in pursuing the mercurial mode of treatment, with the weight of prejudice and malignity in opposition to

to him. Such fortitude is rarely met with in the medical profession ; and when it is, it must secure our admiration and respect. Whether the disease described by Dr. Rush, under the name of the “ Bilious Remitting Yellow Fever,” was produced in the manner the malignant pestilential fever was in Grenada, is a matter of no great importance ; it is sufficient to know, that the diseases were exactly the same ; and that a similar treatment proved successful in both. I have also had uncommon satisfaction in reading the following note in the ingenious Dr. Clark’s late publication : “ Observations on the Diseases which prevail in long Voyages to Hot Countries,” &c. vol. II. p. 297. “ When engorgement of the brain takes place, to any considerable degree, in fevers, no medicine which has hitherto been recommended is capable of removing it ; and therefore I hope I shall be excused for proposing mercury (the only medicine which has been found adequate to remove obstinate congestions in the other viscera) in such a deplorable and dangerous situation. But, at the same time, I confess I am not able to point out the particular cases to which this

this practice will apply, from not being able, certainly, to distinguish *engorgement* of the brain from mere *irritability* of that organ ; the symptoms in both being similar." I trust the observations I have offered in the foregoing sheets will remove the difficulty started by Dr. Clark, and direct the practitioner, in the exhibition of mercury, in malignant pestilential fevers, at least to those stadia of the disease wherein it is the only remedy that can be given with advantage. I am confident, not from analogy, or the probability of the thing itself, but from actual and very extensive experience, that mercury is, in general, the only truly useful medicine in all fevers depending on congestions in the viscera ; or, as I have expressed it in another place,¹ on glandular obstruction and visceral inflammation. And is it not probable that all fevers depend, proximately, on those causes ? Upon the whole, the weight of evidence in favour of the mercurial treatment brought forwards by Dr. Clark, Dr. Rush, Dr. Wade, and myself,

myself, in circumstances nearly similar, must surely impress every mind, even those most influenced by prejudice and theory, with a conviction not only of its utility, but of its certainty, if judiciously conducted.

In India, in England, in North America, and the West India islands, medical gentlemen, totally unconnected with each other, have recurred to the same practice, and hesitate not to declare to the public, that the event has been uniformly the same. Why should not pestilential infection have its antidote, as well as others once equally fatal? "They have narrow conceptions, not only of the Divine Goodness, but of the gradual progress of human knowledge, who suppose that all pestilential diseases shall not, like the small-pox, sooner or later cease to be the scourge and terror of mankind."² Let the knowledge of this salutary innovation in medicine be generally diffused; let the confidence it merits be placed in it; let the destructive dogmata
of

² Rush's Account of the Bilious Yellow Fever,
p. 327.

of theorists be discarded, and no more will
“ Pestilential Fevers be numbered among
the widest outlets of human life.”³

³ Rush’s Account of the Bilious Yellow Fever,
p. 329.

THE END.

A Description

*A Description of the American Yellow Fever,
in a Letter from Dr. JOHN LINING, physician at Charles-town, in South Carolina,
to Dr. ROBERT WHYTT, Professor of Medicine in the University of Edinburgh.**

CHARLESTOWN, December 14, 1753.

SIR,

" IN obedience to your desire, I have sent
" you the history of the yellow fever as
" it appeared here in the year 1748, which,
" as far as I can remember, agreed in its
" symptoms with the same disease, when it
" visited this town in former years. In this
" history, I have confined myself to a faith-
" ful narration of facts, and have avoided
" any physical inquiry into the causes of the
" several symptoms in this disease; as that
" would have required more leisure than I
" am, at present, master of, and would per-
" haps have been less useful than a plain de-
" scription.

P P

I

* March 7, 1754.

" I wrote this history, so far as it relates to
 " the symptoms and prognostics, in the year
 " 1748, when we had the disease last in this
 " place; intending afterwards, if it return-
 " ed, to add, from further experience, the
 " method of cure, and likewise an account
 " of any other symptoms which might at-
 " tend it; but as no such opportunity has
 " offered, I must now omit that part. How-
 " ever, I hope the description which I have
 " given of this dreadful malady, which so
 " frequently rages like the plague in the
 " southern parts of America, is so full, that
 " a physician may, from thence, not only
 " form a true judgment of its nature, but
 " likewise be able to deduce and communi-
 " cate some more certain method of cure,
 " than has perhaps hitherto been used.

" I am sorry I could not give a fuller
 " account of the dissections of those who
 " died of this disease, having unfortunately
 " lost my notes taken from those dissections.

I am, &c.

I. THAT

I. THAT *fever*, which continues two or three days, and terminates without any critical discharge by sweat, urine, stool, &c. leaving the patient excessively weak, with a small pulse, easily depressible by very little motion, or by an erect posture; and which is soon succeeded with an *icteritious* colour in the white of the eyes and the skin, vomiting, hæmorrhages, &c. and these, without being accompanied with any degree of a febrile pulse and heat, is called in America, the *yellow fever*.

II. THIS fever does not seem to take its origin from any particular constitution of the weather, independent of *infectious miasmata*, as Dr. Warren* has formerly well observed.

FOR within these twenty-five years, it has only been four times epidemical in this town, namely, in the autumns of the years 1732, 39, 45 and 48, though none of these years (excepting that of 1739, whose summer and autumn were remarkably rainy) were either warmer

* In his Treatise concerning the malignant fever in Barbadoes, page 8.

warmer or more rainy (and some of them less so) than the summers and autumns were in several other years, in which we had not one instance of any one being seized with this fever; which is contrary to what would probably have happened, if particular constitutions of the weather were productive of it, without infectious *miasmata*. But that this is really an infectious disease, seems plain, not only from this, that almost all the nurses catched it and died of it; but likewise, as soon as it appeared in town, it soon invaded newcomers, those who never had the disease before, and country-people when they came to town, while those who remained in the country escaped it, as likewise did those who had formerly felt its *dire* effects, though they walked about the town, visited the sick in all the different *stadia* of the disease, and attended the funeral of those who died of it. And lastly, whenever the disease appeared here, it was easily traced to some person who had lately arrived from some of the West-Indian Islands, where it was epidemical. Although the infection was spread with great celerity through the town, yet if any from the country received it in town, and sickened on their return home,

home, the infection spread no further, not even so much as to one in the same house.

III. THE subjects which were susceptible of this fever, were both sexes of the white colour, especially strangers lately arrived from cold climates, Indians, Mistees, Mulattoes of all ages, excepting young children and of those only such as had formerly escaped the infection. And indeed it is a great happiness that our constitutions undergo such alterations in the small-pox, measles and yellow fever, as for ever afterwards secure us from a second attack of those diseases. There is something very singular in the constitution of the Negroes, which renders them not liable to this fever; for though many of these were as much exposed as the nurses to the infection, yet I never knew one instance of this fever amongst them, though they are equally subject with the white people to the *bilious fever*.

IV. THIS fever began in the middle or rather towards the end of August, and continued till near the middle of October, when the weather became cold enough to prevent its

its further progres. In the beginning of August, the weather was warmer than I had ever known it in that month : the mercury in Farenheit's thermometer, for some days at 2 o'clock, *p. m.* rose, in the shaded air, to the 96th degree, at which time several people died of apoplexies. The latter part of August and the first week in September were much more temperate ; the weather being then much as usual at that season of the year. The second week in September was cold, the wind being constantly easterly and the weather cloudy ; after which time I kept a register of the heat of the shaded air ; an abstract of which follows.

IN the latter part of September, and from the 1st to the 18th of October,

	Septemb.	Octob.
The mean heat at 2 <i>p. m.</i> was	72	65
The mean nocturnal heat was	68	54
The greatest heat at 2 <i>p. m.</i> was	79	75
The least heat at 2 <i>p. m.</i> was	60	52
The greatest nocturnal heat was	71	70
The least nocturnal heat was	62	42
The greatest increase of heat in 24 hours was	13	17
		The

The greatest decrease of heat in

24 hours was

9 22

IN all the month of September, and in the greatest part of October, the wind was easterly.

THE depth of the rain in August, September and October respectively, was 6.881, 7.442 and 5.550 inches; which, though it exceeded the rain of these three months taken together at a medium, from the ten preceding years, by 5.570 inches, yet it was inferior to that which fell in the same months in several other years; for in the years 1747, 50, 51 and 52, there fell respectively, in those three months of these years, above 21, 22, 24 and 26 inches of rain.

V. FOR a day or two before the attack of the fever, people in general complained of a headache, pain in the loins and extremities, especially in the knees and calves of the legs, loss of appetite, debility and a spontaneous lassitude.

SOME,

SOME, however, were seized suddenly, without any such previous symptoms.

VI. AFTER a chillness and horror, with which this disease generally invades, a fever succeeded, in which,

1. THE *pulse* was very frequent till near the termination of the fever, and was generally full, hard, and consequently strong: in some, it was small and hard, in others, soft and small; but in all those cases, it frequently varied in its fulness and hardness. Towards the termination of the fever, the pulse became smaller, harder, and less frequent. In some there was a remarkable throbbing in the carotids and in the *hypochondria*; in the latter of which it was sometimes so great, that it caused a constant tremulous motion of the *abdomen*.

2. THE *heat*, generally, did not exceed 102 degrees of Farenheit's thermometer; in some it was less, it varied frequently, and was commonly nearly equal in all parts, the heat about the *præcordia* being seldom more intense than in the extremities, when these were kept covered. In the first day of the disease,

disease, some had frequent returns of a sense of chillness, though there was not any abatement of their heat. In a few, there happened so great a remission of the heat for some hours, when at the same time the pulse was soft and less frequent and the skin moist, that one from these circumstances might reasonably have hoped that the fever would only prove a remittent or intermittent. About the end of the second day, the heat began to abate.

3. *The skin* was sometimes (though rarely) dry ; but oftener, and indeed generally, it was moist and disposed to sweat.

ON the first day, the sweating was commonly profuse and general ; on the second day, it was more moderate : but on both these, there happened frequent and short remissions of the sweatings ; at which times the febrile heat increased, and the patient became more uneasy. On the third day, the disposition to sweat was so much abated, that the skin was generally dry ; only the forehead and backs of the hands continued moist.

4. THE *respiration* was by no means frequent or difficult, but was soon accelerated by motion, or the fatigue of drinking a cup of any liquid.

5. THE *tongue* was moist, rough and white, even to its tip and edges. On the second day, its middle in some was brown. On the third day, the whiteness and roughness of the tongue began to abate.

6. THE *thirst* in very few was great.

7. A *nausea*, *vomiting* or frequent *reactions* to vomit, especially after the exhibition of either medicines or food, came on generally the third day, as the fever began to lessen; or rather as the fullness of the pulse, heat, and disposition to sweat began to abate. Some indeed, but very few, on the first day, had a vomiting either biliary or phlegmatic.

8. VERY few complained of *anxiety* or oppression about the *præcordia* or *hypochondria*, nor was there any tension or hardness about the latter.

9. ON

9. ON the first day they generally *dозed* much, but afterwards were very *watchful*.

10. *Restlessness* and almost continual *jactations* came on the second day.

11. A great *despondency* attended the sick from the first attack.

12. THE *strength* was greatly *prostrated* from the first attack.

13. THE *pain* in the *head*, *loins*, &c. of which they had complained (V) before the attack, were greatly increased, and in some, the pain in the forehead was very acute and darting; but those pains went generally off the second day.

14. THE *face* was flushed, and the eyes were hot, inflamed and unable to bear much light.

15. ON the first day, many of them, at times, were a little *delirious*, but afterwards not until the recess of the fever.

16. THE *blood* saved at venæsection had not any inflammatory crust ; in warm weather, it was florid like arterial blood, and continued in one soft homogeneous-like mass, without any separation of the *serum* after it was cold. When there was any separation, the *craffamentum* was of too lax a texture.

17. THE *stools*, after the first day, were fetid, inclined to a black colour, and were very rarely bilious, soft or liquid, excepting when forced by art ; for an obstinate costiveness attended the febrile state.

18. THE *urine* was discharged in a large quantity, was pale, sometimes limpid, and rarely of a higher than a straw colour, except when the weather was very warm, and then it was more saturated, of a deep colour, and discharged in smaller quantities. It had a large cloud, except when it was very pale or limpid ; but more generally it had a copious, white sediment, even in the first day of the fever.

ON the second day, the urine continued to be discharged very copiously ; in some, it was

was then turbid, and deposited a more copious sediment, than on the first day ; this sediment was sometimes of a brownish colour; in which case it was generally followed by bloody urine, either about the end of the second or beginning of the third day. The colour and quantity of the urine, discharged in equal times, were remarkably variable, being now limpid, then of a deeper colour, now discharged in a larger, then in a smaller quantity, which could not be ascribed to any change made either in the quantity or quality of the drink, &c.

VII. THE fever accompanied with those (VI.) symptoms, terminated on the third day, or generally in less than 72 hours from the first attack, not by any assimilation, or coction and excretion of the morbid matter; for if by the latter, there would have been some critical discharge by sweat, urine, stool, or otherwise, none of which happened; and if, by the former, nothing then would have remained but great debility. No; this fever did not terminate in either of these salutary ways, excepting in some, who were happy enough to have the disease conquered in the beginning

beginning by proper evacuations, and by keeping up a plentiful sweat, till the total solution of the fever, by proper mild diaphoretics and diluents. But those who had not that good fortune, however tranquil things might appear at this period, (as great debility and a little yellowness in the white of the eyes, seemed then to be the chief complaints, excepting when the vomiting continued), yet the face of affairs was soon changed ; for this period was soon succeeded by the second *stadium*; a state, though without any fever, much more terrible than the first : the symptoms in which were the following.

VIII. 1. THE *pulse*, immediately after the recess of the fever, was very little more frequent than in health, but hard and small. However, tho' it continued small, it became, soon afterwards, slower and very soft; and this softness of the pulse remained as long as the pulse could be felt. In many, in this stage of the disease, the pulse gradually subsided, until it became scarce perceptible ; and this, notwithstanding all the means used to support and fill it ; and when this was the case, the icteritious-like suffusion, the vomiting

miting, *delirium*, restlessness, &c. increased to a great degree. In some, the pulse, after being exceedingly small and scarce perceptible, recovered considerably its fullness; but that favourable appearance was generally of but short continuance.

2. THE *heat* did not exceed the natural animal heat; and when the pulse subsided, the skin became cold, and the face, breast and extremities acquired somewhat of a livid colour.

3. THE *skin* was dry when the weather was cold, but was moist and clammy when the weather was hot.

4. THE *respiration* was natural or rather slow.

5. THE *tongue* was moist and much cleaner than in the former (VI. 5.) stage, its tip and edges, as also the gums and lips, were of a more florid red colour than usual.

6. VERY few complained of *thirst*, though they had a great desire for cold liquors.

7. THE

7. THE vomiting or *reaching* to vomit increased, and in some was so constant, that neither medicines nor aliment of any kind were retained. Some vomited blood; others only what was last exhibited, mixed with phlegm; and others again had what is called the *black vomit*.* The reaching to vomit continued

* That which is called the *black vomit*, at first sight, appears to be black; but on a more careful examination, I observed, that this colour proceeded from a great quantity of small, flakey, black substances which floated in the liquor thrown up by vomit; but the colour of this liquor was much the same with that which the patient had last drank, and was by no means black. Those black flakey substances are the bile mixed with, or adhering to the *mucus* which lined the stomach. For, upon dissection of those who died of this disease, not only in this but former years, I always observed that the *mucus* of the stomach was abraded, and the bile in its *cylsis* was black and sometimes very viscid. In a lad who died of this disease in the beginning of the fourth day, and who was immediately opened, the bile was not only black, but had the consistence of thick *Venice-turpentine*, and was exceedingly tough. On the inside of the stomach, there were several carbuncles or gangrenous specks. And in all those I have dissected, who have died of this disease, I have not only always observed the same, but likewise that the blood was very fluid, and the vessels of the *viscera* much distended; from whence I have been very inclined to think, when the disease was not conquered in its first *stadium*, that, about the time of the termination of the fever, there was a *metastasis* of the morbid matter to the *viscera*.

continued a longer or shorter time, according to the state of the pulse ; for as that became fuller, and the heat greater, the reaching to vomit abated, and *è contra*.

8. THE inquietude was very obstinate, and when they dozed, their slumbers were but short and unrefreshing. There were some who were drowsy ; but these always awaked, after the shortest slumbers, with a great dejection of spirits and strength.

9. THE *jaetations* or restlessness was surprising ; it was frequently scarce possible to keep the patients in bed, though, at the same time, they did not complain of any anxiety or uneasiness ; but if asked how they did, the reply was, *Very well.*

10. THE debility was so great, that, if the patient was raised erect in the bed, or, in some, if the head was only raised from the pillow, while a cup of drink was given, the pulse sunk immediately, and became sometimes so small, that it could scarcely be felt ; at this time, they became cold, as in a *horripilatio*, but without the anserine-like skin :

their skin became clammy, the *delirium* increased, their lips and skin, especially about the neck, face and extremities, together with their nails, acquired a livid colour.

11. THE *delirium* returned and increased; it was generally constant in those whose pulse was small and subsiding.

12. THE inflammation of the *tunica conjunctiva* or white of the eyes increased much, but without pain.

13. A *yellowness* in the white of the eyes, if it did not appear before in the febrile state, became now very observable, and that *icteritious*-like colour was soon diffused over the whole surface of the body, and was continually acquiring a deeper saffron-like colour. In some indeed no yellowness was observable, excepting in the white of the eyes, until a little before death, when it increased surprisingly quick, especially about the breast and neck.

14. THERE were many small *specks*, not raised above the skin, which appeared very thick

thick in the breast and neck ; but less so in the extremities, and were of a scarlet, purple or livid colour.

15. IN women the *menstrua* flowed, and sometimes excessively, though not at their regular periods.

16. THERE was such a putrid dissolution of the blood in this *stadium* of the disease, that, besides the vomiting of blood formerly mentioned, and the bloody urine soon to be taken notice of, there were *hæmorrhagies* from the nose, mouth, ears, eyes, and from the parts which were blistered with *cantharides*. Nay, in the year 1739 or 1745, there was one or two instances of an *hæmorrhage* from the skin, without any apparent puncture or loss of any part of the scarf-skin.

17. AN obstinate *costiveness* continued in some ; in others, the stools were frequent and loose ; in some, they were black, liquid, large and greatly fatiguing ; in others, when the stools were moderate, even though they were black, they gave great relief ; in others again, the stools nearly resembled tar
in

in smoothness, tenacity, colour and consistence.

IS. THE urine was discharged in a large quantity, in proportion to the drink retained by the patient: it was pale if the patient was not yellow; but if yellow, then it was of a deep-saffron colour; in either case it had a sediment, or at least a large cloud, which remained at the bottom of the glass; in some, it was very turbid, in others, it was bloody, and the quantity of blood discharged with the urine bore always some proportion to the state of the pulse; when that became fuller, the quantity of blood in the urine was diminished: when the pulse subsided, the bloody urine increased, and even returned after it had ceased some days, soon after the pulse became smaller.

THIS stage of the disease continued sometimes seven or eight days before the patient died.

IX. WHEN this *stadium* (VIII.) of the disease terminated in health, it was by a recess or abatement of the vomiting, hæmorrhagies,
delirium,

delirium, inquietude, jactations, and icterious-like suffusion of the skin and white of the eyes; while, at the same time, the pulse became fuller, and the patient gained strength, which, after this disease, was very slowly.

BUT when it terminated in death, those (VIII.) symptoms not only continued, but sooner or later increased in violence, and were succeeded with the following, which may be termed the *third stadium* of the disease, which quickly ended in death.

X. THE pulse tho' soft became exceedingly small and unequal; the extremities grew cold, clammy and livid; the face and lips, in some, were flushed; in others, they were of a livid colour; the livid specks increased so fast, that in some, the whole breast and neck appeared livid; the heart palpitated strongly; the heat about the *præcordia* increased much; the respiration became difficult, with frequent sighing; the patient now became anxious, and extremely restless; the sweat flowed from the face, neck and breast; blood flowed from the mouth, or nose

nose or ears, and in some, from all those parts at once; the deglutition became difficult; the hiccoughs and *subfultus* of the tendons came on, and were frequent; the patients trifled with their fingers, and picked the naps of the bed-cloaths; they grew comatous, or were constantly delirious. In this terrible state, some continued eight, ten or twelve hours before they died, even after they had been so long speechless, and without any perceptible pulsation of the arteries in the wrists; whereas, in all other acute diseases, after the pulse in the wrists ceases, death follows immediately. When the disease was *very* acute, violent convulsions seized the unhappy patient, and quickly brought this *stadium* to its fatal end. After death, the livid blotches increased fast, especially about the face, breast, and neck, and the putrefaction began very early, or rather increased very quickly.

XI. THIS was the progress of this terrible disease through its several *stadia*. But in hot weather, and when the symptoms in the first stage were very violent, it passed thro' those stages, as Dr. Warren has likewise observed,
with

with such precipitation, that there was but little opportunity of distinguishing its different *stadia*; the whole tragedy having been finished in less than 48 hours.

XII. It was remarkable, that, 1. The infection was increased by warm and lessened by cold weather. 2. The symptoms in the several *stadia* were more or less violent, according to the heat or coolness of the weather. In hot days, the symptoms were not only more violent, but in those who seemed, in moderate weather, to be on the recovery, or at least in no danger, the symptoms were all so greatly heightened, when the weather grew considerably warmer, as frequently to become fatal. In cool days, the symptoms were not only milder, but many, who were apparently in great danger in hot days, were saved from the very jaws of death by the weather becoming happily cooler. 3. The disease was generally more fatal to those who lay in small chambers not conveniently situated for the admission of fresh air, to those of an athletic and full habit, to strangers who were natives of a cold climate, to those who had the greatest dread of it, and to those

those, who, before the attack of the disease, had overheated themselves by exercise in the sun, or by excessive drinking of strong liquors; either of which indeed seemed to render the body more susceptible of the infection. Lastly, the disease proved most certainly fatal to valetudinarians, or to those who had been weakened by any previous disease.

XIII. THE *prognostics* in the first *stadium* are these. 1. The more acute and constant the pains are in the head, loins, knees, &c. the more the eyes are inflamed; the greater their inability is to bear light, and the more the face is flushed at the first attack, the fever and all the symptoms (VI.) in the first *stadium* will be the more violent. 2. The more intense the symptoms are in the first state, the sooner will the fever terminate. 3. The sooner the disease runs thro' the first *stadium*, the shorter will be the duration of the second, and *& contra*. 4. The shorter the duration is of the first, the greater and more certain is the danger in the second state. For when the fever terminated before the beginning of the third day, death seemed inevitably

inevitably to be the consequence, as there was then no possibility of supporting the pulse, and as all the bad symptoms were then hurried on with such precipitation, that the patient generally died before the end of the fifth day, excepting a considerable coolness of the weather happily intervened; but on the contrary, it was a favourable circumstance when the fever was protracted to the end of the third day, without any remarkable hardness or depression of the pulse. 5. A great depression of the pulse, about the termination of the fever, is bad, since, from that circumstance, the vomitings, incessant jaætations, the coldness and lividness of the extremities, hæmorrhagies, *delirium*, &c. are ushered in with surprising celerity. 6. The more the strength is prostrated from the first attack, the greater is the danger. 7. A vomiting coming on early in the disease, and continuing or increasing, is bad, and generally presages the *black vomit*. 8. A sediment in the urine in the first and second day of the disease is bad, and the more copious the sediment is, the greater is the danger.

XIV. THE prognostics in the second *stadium* are these: 1. An early yellowness in the white of the eyes is bad: when it is observable about the end of the second day, in the first *stadium*, the patient generally dies about the beginning of the fourth day from the first attack of the disease. But when the yellowness does not appear till the end of the third day, if the patient does not recover, the disease sometimes continues to the 9th or 10th day of the second *stadium* before the patient dies. When the yellowness of the skin and eyes increases fast and acquires soon a deep icteritious-like colour, the greatest danger is to be apprehended. 2. If the inflammation of the white of the eyes increases, it is bad. 3. The more inflamed and bloody-like the skin is where it has been blistered, the greater is the danger. 4. If the vomiting continues or increases, it is bad, but the *black vomiting* is generally mortal. 5. When the pulse varies frequently in its fullness, being sometimes small, then fuller, it is bad. But there was less dependence to be had on the pulse in this than is common in other diseases; for in some patients, in the second stage of the disease, even

even within a few hours of their death, the pulse, with respect to its fullness, softness, equality and frequency, has continued like that of one in perfect health, although, from the other symptoms, the death of the patient could be foretold with great certainty. 6. The more the strength of the patient is reduced in the first, the greater is the danger in the second *stadium*. 7. Great restlessness, inquietude, an early *delirium* and a continuation of it are very bad. 8. Livid blotches about the neck and breast, a lividness of the lips and nails, flushing of the face, or a livid colour thereof, are sure signs of the quick approach of death. 9. Frequent loose stools, which give not any relief, are bad, and the sooner they spontaneously happen, the greater is the danger : but those which are black, and continue so without any abatement of the symptoms, are generally mortal. 10. Bloody urine and all *hæmorrhagies*, excepting slight ones from the nose, are bad ; and the more copious they are, the greater is the danger. But a flux of the *menses*, though not at their regular period, if attended with an abatement of the symptoms, is a favourable circumstance, otherwise

otherwise it is bad. II. A suppression of urine, especially in those, who, in the course of the disease, have had large discharges that way, is a certain sign of the quick approach of death.

XV. As to the prognostics in the third (X) *stadium*, it is sufficient to say,

“ Nature, alas ! was now surpriz’d,
 “ And all her forces seiz’d,
 “ Before she was how to resist advis’d.”*

* Dr. Sprat’s Account of the plague of Athens.

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